THE AMERICAN GAS LIGHT JOURNAL INC.

PUBLISHED WEEKLY, AT No. 42 PINE STREET.

VOLUME XCIX., No. 21. Whole No. 2,007. | NEW YORK, MONDAY, NOVEMBER 24, 1913. | Subscription, $3 Per Year. $4 Canada, $5 Foreign.

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New Business.

[Address by MR. J. P. HANLAN before the New Jersey State Gas Association.]

I will not attempt to review past efforts or successes, but rather try to point out what appear to me the possibilities for new business and what, in my opinion, are some of the ways this new business can be secured at a reasonable cost.

The first, and most important, new business effort we all can and should make is to do everything possible to hold the business we now have, for the permanency of our business, new and old, depends upon what we do right now to perfect our present service to our customers. If we give them satisfactory and dependable service, commensurate to their needs, we will do much toward holding present business and have a reasonable assurance of permanently holding other future business; and, because of this good service, more easily secure the business of new customers. Some things bear continuous repetition, and the old saying that a satisfied customer is the best asset is particularly true for a company supplying a public utility. Because of the usual prejudices against them, not ordinarily directed against most other lines of business, and which can only be overcome by rendering good service to each individual consumer, and getting not only his goodwill, but the value of that best advertising of all, "mouth-to-mouth advertising," as a consequence of this goodwill. Any one of us can make a start to-day towards securing some of this goodwill asset by doing away with unnecessary annoyances to our customers through preventable errors by the new business department, or the accounting department, and unnecessary severity by the collection and credit departments. Try to prevent slipshod work, or undue delay in executing orders, due to lack of forethought in ordering stock, or allowing manufacturers to delay shipment unreasonably; or selling our customers unsatisfactory, inefficient or unsuitable appliances, or allowing others to do so.

Just think how much valuable time you put in trying to overcome harmful influences occasioned by some or all of these preventable things. We can figure the time lost; but, can we compute the energy expended, which might have been devoted to thinking out ways and means of securing new business? We cannot total the large amount of business which has been actually driven away, yet we all know we do lose business that should be on our books. My thought in calling forcible attention to this now is to impress upon all men connected with the industry, and upon new business men in particular, the fact that much of it can be prevented, and that it is a part of the job of each of us to keep hammering away at this until most of these new business deterrents are put behind us. Let me remind you that "The man who wins is the man who stays in the unsought paths and the rocky ways." Do not be discouraged because you have to do the same job over-and-over again. The sun has been rising and setting for a great many years.

The next important thing, to my mind, in getting new business is to think and plan ways to get it. I once heard a prominent gas man say, "It hurts some men to think;" but think and plan we must if we are to get the new business that lies beyond the "beaten path." No doubt all of you have seen the advertisements of the telephone company, calling attention to its telephone engineer. In the advertisements he is shown, seated at a table, mapping out telephone stations and equipment to take care of the business they expected and that will be secured in the next 20 years.

How many of us are figuring out the new business possibilities for us in the next 20 years; possibilities that can be made certainties, just as the growth of the telephone business is sure, because people will surely need the service gas can give them, more than they need the convenience a telephone affords.

We can all think, and we can all observe, what some other fellows are doing, and we can all get suggestions and inspiration from men who are "doing things" in the gas business, or in any other businesses. Many of the ideas and methods pursued by John Wanamaker and Marshall Field, which have made them known the world over as the greatest of all merchants, can be just as well applied to the gas business. After all, their business, like ours, was and is a "selling proposition." The only difference is, that they are selling one kind of service and we another.

The next thing we gas men need (all of us) is more initiative and more imagination. The "Mary Elizabeth Stores" were originated by a woman; all of you have probably heard of them. Originally started on a little street in Syracuse they now have one on Fifth avenue, New York. All of you know of "Beechnut" bacon, but most of you may not know that it resulted from two young fellows conceiving the idea of curing hams and bacon by a more painstaking and better process and of selling them, not by the ham or strip, but by the slice. It required imagination and initiative to start both of these businesses, for in neither case did they have money, but in both cases they did have the courage of their convictions; and one of them is selling candies and confections by the ton, the other ham and bacon by the carload at pound prices.

This brings me to say, "Don't be afraid to make a start; don't be

a doubter yourself, or allow anyone to throw cold water on an idea, if you have thought it out well, and from all sides."

Reading a book on advertising the other day I came across the following: "A college professor in addressing his graduating class said, 'Don't say that a thing can't be done, because if you do some darn fool will come along and do it." After all, nothing is impossible, and the fellow who says it, is often interrupted by some other fellow doing the "impossible."

Another most important requisite, necessary to get the maximum results from our business, is a more accurate knowledge of the goods we are selling, and the possibilities of our service. I include every man in this, whether he is selling goods to the gas companies or selling goods or service for them. Education is valuable in many ways. It means more than knowledge; it means confidence. And with knowledge and confidence, enthusiasm should come, and does come.

When every man and woman in the gas business fully appreciates its possibilities, who can predict what the future holds for us, since many well posted gas men say we have only scratched the surface. It, therefore, is the duty of each to become better posted, and to encourage our business associates to a better acquaintance with the gas business by cheerfully placing at disposal means for acquiring the knowledge that will enable them to do so. In the gas business today the demand for men who can get business is greater than it has ever been; but the men needed are those who have knowledge, or who can and are willing to acquire the knowledge, to fit them for the jobs they are expected to fill. The larger and older a business grows the more its need for men who can look at it from a larger, broader and newer viewpoint. Other lines of business have these men. Why shouldn't we?

Nowadays it takes more than ordinary sales-ability to light a store properly, and the successful lighting representative is the chap who cannot only sell lighting appliances, but who knows which appliance to sell and where it should be placed to give the best results to the customer. When an installation of this kind is sold, it usually stays sold, because it has been sold right. We need the same kind of sales' representatives to sell gas industrial service to manufacturers; to sell architects or contractors and people who build homes and other buildings. All these should have our service, and would have it be cause it is something they need, if its merits are placed before them by intelligent and enthusiastic sales' representatives.

With the groundwork laid as outlined, all of the present uses for our product will be greatly extended and new uses will be found. All-gas kitchens will be the usual kitchens in old as well as new houses; in the homes of the men who work for a daily wage as well as in the residences of those who have more of this world's goods. Houses will be heated by gas, and better lighted with gas than they are to day. We will be doing many things by gas in 10 years—yes, even in 5 years—that now seem a long way beyond us. Of course, to achieve these things will require men with stout hearts and intensity of purpose; men who can stand hard knocks. No business nor any man ever succeeds without receiving blows, and his degree of success depends on how well he stands up under them.

In closing I am reminded of this little saying: "In a gale you need men to man the ship. If all were fair weather sailing, women would do, and they could take their sewing baskets with them."

Illumination and Education: Notes on a Discussion, Conference of Educationalists, National Gas Exhibition, London, England.

[By a "Special Correspondent."]

One of the most important of the series conferences at the National Gas Exhibition in London was that devoted to school lighting and education. The Chair was taken by Sir George Kekewich (formerly Secretary to the Board of Education), and a number of interesting points were raised in the discussions.

In introducing the subject Sir George recalled cases in his experience where the lighting of schools had received scant attention—he mentioning a country school the windows of which were almost completely overgrown by a fine Gloire de Dijon rosebush, a delightful object from outside, but which effectually prevented any light entering the room! As regards artificial lighting he laid special stress on the importance of avoiding the glare from modern brilliant sources, shading the lights from the eyes of teacher and children.

Prof. S. P. Thompson read a paper, dealing mainly with the brightness of lights as compared with their candlepower. He pointed out the need to diffuse the light by globes and by reflection from walls, declaring that the ceilings of schoolrooms should invariably be white, and the walls papered or stained in colors approximating light greys, browns or greens, etc. He demonstrated how easily illumination could now be measured, and expressed the hope that, in the future, Boards of Education would have inspectors equipped with illumination-photometers so as to see that the lighting conditions in schoolrooms were up to the mark.

In concluding, Prof. Thompson briefly summarized the conclusions (as regards artificial lighting) of the committee appointed by the Illuminating Engineering Society to study school lighting. There was general agreement that the reading illumination on the desk should not be less than 2-foot candles, while some thought that 2½-foot candles should be the absolute minimum; but for special work, such as drawing, sewing, etc., 4-foot candles was recommended, and also for local blackboard lighting where diagrams in colored chalk were shown.

Subsequently, a paper on "The Physiological and Mental Disadvantages of Unscientific Illumination," by Mr. Leon Gaster, was read (in the author's absence) by Mr. J. S. Dow. Here again the work of the committee of the Illuminating Engineering Society was summarized. Dr. Kerr, Medical Officer to the London County Council, was quoted to the effect that a child, to whom the characters are unfamiliar, requires a higher illumination to work by than an adult, to whom reading is second nature. Working by poor illumination causes children to bring the books near their eyes, leads them to assume unnatural, cramped positions, and is a frequent cause of short sight. It has also been shown that light from the wrong direction causes children to take an abnormal position in writing, leading to spinal curvature. Hence poor illumination, besides injuring the eyes, leads to other evils. Moreover, children who become short-sighted cannot study properly, so their education suffers and they go into life handicapped for the industrial struggle.

Another strong argument for good illumination is that it acts by force of example. If children see in a school room antiquated and ill-kept lighting arrangements—dirty chimneys and globes and mantles falling to pieces—they go out into life with a low standard, in fact, prepared to view with indifference similar conditions in their own homes. So the evil of poor lighting becomes perpetuated.

The vast importance of lighting is shown by the fact that there are in the schools of London over 1,000,000 children at work. Mr. Gaster urged that the matter was of sufficient importance to receive strong government support.

In the discussion that ensued Mr. A. J. Martin pointed out that an important matter like this should come under the notice of the Board of Education. Mr. F. W. Goodenough, in expressing his conviction as to the value of good illumination, laid stress on the prejudicial effect of very shiny paper. In the afternoon a paper, by Septimus Warwick, F.R.I., and Austen Hall, F.R.I.B.A., dealt with "The School of the Future." Besides discussing at some length ideal systems of heating and ventilation the authors quoted the recommendations on lighting of the Illuminating Engineering Society, and strongly recommended the work of the Society to the notice of the architectural profession. A vote of thanks to Sir George Kekewich for presiding closed the proceedings.

Fig. 1.—Model Gas Lighted Schoolroom at the National Gas Exhibition, London.

In connection with this conference, an exhibit at the gas exhibition (the model schoolroom shown in Fig. 1) deserves special notice. It is arranged to represent an ordinary schoolroom, but two alternative methods of producing the desired general illumination are shown. Towards the back of the room will be seen two semi-indirect fixtures (this method of lighting was very widely shown at the exhibition) and in front are two specially designed, direct fixtures, consisting of a partially obscured globe under an opal shade. There is also a special shaded lamp for the blackboard. All these lights are arranged so as to screen the mantles from the eyes of children and teacher, and to give the requisite degree of illumination on blackboard and desks.

From the view of the night nursery (shownin Fig. 2) which is also of interest, it will be seen that the general lighting is provided by a central, semi-indirect unit, while burners are placed over each bed. Fig. 3 shows the entrance to the exhibition. High up will be seen the special, handsome, fittings consisting of 500-candle power lights within diffusing glass frames. These gave a decidedly ornamental effect.

Some fuller particulars of the exhibition, and particularly the conferences dealing with lighting and illumination, will be found in the November number, *The Illuminating Engineer*, London.

Fig. 2.—A Night Nursery Illuminated by Central Semi-Indirect Fitting, at the National Gas Exhibition, London.

Fig. 3.—View of Entrance Hall to National Ga Exhibition, London, Showing Special Fittin

(Continued from page 315.)

Practical Effects of the Michigan Workmen's Compensation Law Especially as it Affects Gas Companies.

[A paper by Mr. A. G. Schroeder, Detroit Meeting, Michigan Gas Association.]

Effects on Gas Companies.

Having to some extent considered the law as it relates to all employers, we shall consider what its effects are on the gas companies in the State. The writer sent to every gas company to obtain information, as to their experiences, and the statements and suggestions that follow are based upon the information received.

With the exception of a few of the smaller ones all gas companies elected to come under the provisions of the law. Those companies who did not, have been fortunate in the matter of accidents in the past. In the larger plants, in which accidents are of more frequent occurrence, the only course possible was to operate under the law. Probably most of the companies had been carrying employers' liability insurance, but such insurance policies were either automatically (or by action of the insurance companies) canceled as of September 1st, and the new rates covering workmen's compensation put into effect. It was possible to insure against employer's liability, but the cost of such insurance was as great as that for workmen's compensation under which the employee would get the benefit without legal action. The new insurance rates covering workmen's compensation were not announced until a few weeks before the law went into effect, and were found to be from 3 to 6 times as high as the previous rates for employers' liability. The manual rate quoted for general operation of gas works, shops, etc., was $2.48 per $100 of pay-roll, or practically 2½ per cent., and practically all of the larger companies decided to carry their own insurance. Several companies report that they at first carried their own risk and later took out insurance. The majority of the smaller companies carry insurance, mostly with stock companies. One company is insured with the Commissioner of Insurance. Several companies carry insurance only on part of their risk.

Companies Carrying Insurance.

Most of us feel that the new insurance rates are very high. Unquestionably they were more or less experimental, although experience under the old employers' liability policies was without doubt taken into account. Though most of the legal expense had been abolished by the new law, the insurance companies were required to pay definite sums in every case, while under the common law they were often able to make settlement for considerably less than the merits of a case warranted. In making rates it has been the custom of the insurance companies to name a flat rate covering an entire classification or industry, regardless of the moral hazard of the individual taking out the insurance. However, for some little time there has been a movement to place the rating of these risks on a "merit system," as is done in fire insurance. That is, employers who are making special effort to avoid accident, are to receive the the benefit of their good management by being quoted lower rates. It would be well for gas companies that have made special efforts to safeguard their plants to take this matter up with their insurance agents, asking for special rating. It is likely some agents will be unfamiliar with this, but they can take it up with their home office.

As already noted, the law permits of mutual insurance companies for carrying workmen's compensation risks, so the proposition suggests itself whether the smaller gas companies in this State would profit by the formation of a mutual insurance company. There are at present two such companies, one organized by Detroit manufacturers, the other by furniture manufacturers of Grand Rapids. The disadvantage would be that the members of a mutual company, covering the smaller gas companies, would be so widely scattered that it would

not only be expensive to administer, but it would be difficult to keep in close touch with individual companies, and equally difficult to handle individual cases to the satisfaction of the member-companies. Without doubt it is safest and most satisfactory for the smaller gas companies to carry insurance in well established stock companies, to safeguard their premises to prevent accidents, and to work for a reduction in rates. While the increased cost of insurance is a considerable burden to some companies, by carrying such insurance their expenses are fixed; and, as it is expected that each industry shall bear the burden of compensating for accidents therein, the cost of such insurance is a legitimate item in the cost of gas and should receive due consideration in the fixing of rates.

Companies Carrying Their Own Risks.

With the larger gas companies, where the premiums for workmen's compensation insurance at the new rates ran well up into 4 figures, and where the opportunity for systematic accident prevention is better, the matter is somewhat different. Evidently most of these companies felt they wished to experiment the first year, or until the insurance companies had adjusted rates. The common practice in such companies has been to build up a reserve by setting aside monthly a certain amount, instead of what was formerly paid out for liability insurance. In most companies the rates taken for this were the new rates offered for workmen's compensation insurance. With few exceptions the companies carrying their own insurance have profited thus far; but, of course, while during the first few years a fair reserve may be built up, a succession of accidents, or a catastrophe, may charge this reserve to a deficit. An attractive feature of carrying one's own risk is that one can treat directly with his employees instead of through a third party. Even under the compensation law there are cases where a degree of liberality is desirable, and not obtainable from an insurance company. On the other hand, many cases have been settled by the insurance companies where there would have been good grounds for appeal.

It is a question whether it is good business to continue to carry our own risk if the insurance rates are brought down to a reasonable figure, but every company must decide for itself. There is this difference, between carrying employers' liability insurance, and workmen's compensation insurance, that, under the present law our liability is fixed and we are not subject to unreasonable awards for damages by prejudiced juries. If we exercise care, and are fortunate for a few years until we accumulate a fairly large reserve, the situation becomes very different, and we could probably continue profitably to carry our own insurance. Whether we carry our own insurance or let some one else carry it, prevention of accidents is of tremendous importance and, aside from the humanitarian feature, can be directly translated into dollars and cents.

The Importance of Furnishing a First-Class Surgeon.

The law requires the employer, during the first three weeks following the injury, to furnish reasonable medical and hospital service and medicines free of charge. If we have insurance, this expense is born by the insurance company to whose interest it is to see that good surgical aid is provided. If we carry our own risk it becomes of very vital importance. With some companies the medical expense has amounted to more than the money paid for actual compensation. It is hard to overestimate the value of a first-class surgeon, or the importance of getting the employee into his hands as quickly as possible, and keeping him under the doctor's charge until he is in shape for work, even though it may be necessary to assume more than the 3 weeks doctor bills. The question has arisen whether the employer has the right to insist that the employee be treated by the surgeon he provides, and while no definite ruling has been handed down, it would seem the Board would have to hold, that if the employer furnishes a first-class surgeon there should be no objection on the part of the employee to submit to such treatment. On the other hand, in many cases employees have engaged their own doctors principally because the matter was left to them, and in such cases, too, the physicians have frequently sent in exorbitant bills. In case of claim for compensation the law entitles the employer to have his physician examine the employee, and the employee have his own physician present. All of this is avoided if the employer provides the surgeon under a definite arrangement or contract. It is exceedingly important that all employees, especially those in charge, be impressed that every injured employee, no matter how slight the injury, must at once present himself to the surgeon for examination. The doctor should immediately report the case and it is well to provide him with forms for this purpose which he can mail in. This is also a check on the report from the department in which the injury occurred. A complete record and report should always be made and kept on file, and it is well to make such reports, even in cases where there appears to be no disability, because such cases may develop later into the kind that make trouble. If the disability exceeds 15 days this report is made the basis of the report to the Industrial Accident Board.

Methods of Procedure under the Law.

When an employer desires to notify the Board that he elects to come under the law, a blank form provided by the Board is sent him to be filled out. On this he must state what method of payment he has decided on—whether he will carry his own risk, or insure. If he wishes to carry his own risk he must present an affidavit showing his resources. If the declarations of the employer are satisfactory to the Board, he is notified that his selection is approved, and he is sent notices for posting around his establishment, that he is operating under the workmen's compensation law. If an employee desires, in case of accident, to proceed against his employer under the common law, he must serve notice, at the time of his entering employment, that he so elects; or at the time the employer becomes subject to the provisions of the law, he tacitly assents if he remains in service 30 days after.

Some manufacturers require each employee to state definitely, at employment, whether or not he elects to be under the law; in other words, they do not act on the assumption that the employee has waived his rights tacitly.

In event of an accident which involves the loss of at least a full working day, the employer is required to send to the Industrial Accident Board a brief report on a weekly report form, on which are given the date of injury, name, occupation, nature of injury, number of days lost, and the medical expense, if it is known at the time of report. In larger concerns it is good practice to send one of these reports each week, even if no accidents have occurred, that fact being noted on the report. In this manner the weekly report becomes a routine matter and is not overlooked. It is also the intent to carry forward, on the weekly report form, the names of all employees incapacitated totally or partially, supplementing previous reports, so that the last one gives complete information up to that time, and so that, as long as an employee is incapacitated or receives compensation, his name will appear.

In case the accident involves the loss of a member, or death, or disability continuing for more than 14 days, a detailed report is required on form "No. 6: First Report of Accident." This report calls for all the details and is a notice to the Board that compensation is due. The time for making this report, in cases involving the loss of a member or death, is within 10 days after the accident. Where the accident results in disability only, the report is to be made on the 15th day. Theoretically the employee is required to serve written notice of injury on the employer "Form No. 5. Notice to Employer of Claim for Injury." In practice it is usually filled out for the employee, by the employer at the time that agreement in regard to compensation is drawn on Form No. 10. On this latter are recited the full particulars of the accident and the terms of the agreement between the employer or insurance company on his behalf, and the injured employee. If the terms of this agreement are approved by the Board, a notice is sent to the employer reading as follows: "The agreement in regard to compensation in the above case has been passed upon by the Industrial Accident Board and approved. It is required by the Industrial Accident Board that receipts on account of compensation (Form No. 11) be taken when payments are made, the same to be submitted to the Board monthly. A settlement receipt (Form No. 12) is to be signed when final payment is made, and to be accompanied by final report of accident (Form No. 7-A). The receipts on account and final settlement receipts are forms provided by the Board which show in detail the period covered and the amounts of compensation. A receipt on account of compensation is usually to be taken each week, as it is the intent of the law that payments should be made weekly. After weekly payment has been continued for not less than 6 months, the Board may approve of the payment of a lump sum in order to redeem further liability, the deferred payments being commuted on the present worth thereof at 5 per cent. In no case, however, may a lump sum payment be made without specific approval by the Board. The object of this is to prevent the employee from squandering his compensation. The final report of accident (Form 7-A) shows the total amount of compensation paid and the total medical cost, completing the history of the case. No acknowledgments are made by the Industrial Accident Board of settlement re-

ceipts or final reports of accidents, their approval letter covering agreement in regard to compensation being sufficient to close the case as far as the Board is concerned. If, however, receipts covering payments are not filed from time to-time in accordance with the requirements of the Board as stated in the approval letter, the employer is notified.

GENERAL COMMENTS ON THE LAW.

(a) There was some talk of an amendment permitting employees to choose, after the occurrence of an accident, whether to take compensation as provided by the Act or to proceed against the employer under the common law.

(b) At present the employee must lose 2 weeks' pay to get ½ week's pay, and attempt will be made to reduce the period of no compensation from 2 weeks to 1 week. This is highly undesirable, because, while it would benefit employees in meritorious cases, it would increase the temptation to soldier. It would greatly increase the cost of compensation and insurance rates.

(c) The difficulty of obtaining immediate reports on minor accidents is an objection. However, it seems up to the employer to see that every accident is promptly discovered and reported.

(d) The insurance companies have paid many claims which, on arbitration or appeal, would probably have been decided in favor of the employer, they preferring to settle for the sake of economy and keeping in good standing with the Board. This is not always advisable because in many cases the Board would doubtless welcome appeals to clearly define its power.

(e) The State insurance department bases its rates upon 60 per cent. of the stock insurance companies' manual rates, but provides no medical aid. The stock companies claim there has been a great decrease in the number of subscribers for State mutual insurance and that, as the law is more generally understood, employers prefer stock company insurance with its fixed premiums.

(f) The Accident Board, handicapped by inadequate appropriations, is unable to do necessary statistical work.

(g) The law does not cover occupational diseases, but where an employee died of lead poisoning, his family was allowed full compensation.

(h) One objection urged is that, in some cases the employee might be disabled for more than 3 weeks, and inasmuch as the law only compels the employer to pay for the first 3 weeks surgical, medical and hospital services, the cost of this for the period in excess of 3 weeks might amount to more than the compensation received. While this could be, in many cases it is to the advantage of the employer or insurance company to assume medical expenses after the 3 weeks, as the period of compensation is correspondingly reduced. Then, too, in meritorious cases the employer voluntarily sees the spirit of the law carried out and the employee properly cared for. In many cases employers and insurance companies have voluntarily assumed such additional expenses.

CONCLUSION.

While no doubt there are some things in the law that are not ideal, from a broad point of view is it not rather remarkable that so few real defects have been found and that there is not more dissatisfaction with it, considering that it must please both capital and labor? In all legislation of this nature there are bound to be cases where individuals will suffer, and where apparently full justice is not done; but, taking the law as a whole, the writer feels safe in saying that its first year of operation has been such that very few employers in the State, gas companies included, would care to go back to former conditions.

Report of Committee on Utilization of Gas Appliances.

[Presented at the Eighth Annual Meeting, American Gas Institute.]

SECTION I.—RANGE SPECIFICATION.

In this report the Committee notes that at last year's meeting the Institute adopted a standard specification of gas ranges, which specification was adopted by the National Commercial Gas Association at its meeting in December. This specification was incomplete in that it omitted a standard cock or valve; but the committees felt it unwise to take definite action on these most important fittings until very sure of its ground. Two designs of gas cock are now being tried on a large scale, and various designs of valves are being studied and tried in practice. Your committee advises a further postponement and thinks it probable that a definite recommendation will be made at the Institute meeting in 1914.

Your committee believes that the standard gas range specification has been well received by manufacturers as a class, but it is probable that some will not take definite action towards altering their present output to conform to the specification until their customers begin to demand ranges that do so conform. Your committee advises managers and purchasing agents of gas companies to insist on ranges made in accordance with the specification, as this is the best way to be sure of securing good efficiency combined with high durability and ease of repair.

SECTION II.—WATER HEATING.

Gas consumers in increasing numbers are learning to appreciate the luxury of an ever-ready and exhaustless supply of water, but the problem of successfully applying a thermostat to the kitchen water heater and tank seems to be no nearer a solution than it was when last year's report was written.

SECTION III.—INDUSTRIAL AND HOTEL APPLIANCES.

The flurry in oil prices has imparted a decided impetus to the trade in industrial appliances. New manufacturers of such appliances are entering the field, and healthy competition is developing. These appliances use compressed air, and one gas company laboratory is experimenting on a type in which the gas is compressed and the air drawn in at atmospheric pressure.

The development of appliances, domestic and industrial, in which gas is burned by surface combustion, has made considerable strides. Much experimental work has been done by the company interested in this process, but when this report was written no appliance using this method of combustion had been put on the market. The committee believes that, for some classes of work, surface combustion methods will permit the localization of heat at the point where it is needed, and will result in improved efficiency. The development of this method will be watched with great interest.

In hotel and restaurant appliances there is little to add. The demands of the hotel kitchen are closely studied by the manufacturers and by the appliance departments of the larger gas companies, and hotel gas ranges and appliances are slowly becoming better adapted to meet these requirements.

SECTION IV.—ROOM HEATERS.

The points regarding gas room heaters, that were made in last year's report, may be briefly summarized as follows:

(1.) Of heaters without a flue connection, the yellow flame type is to be preferred.

(2.) If a blue flame, or atmospheric burner heater is used, it should be connected to an effective flue.

(3.) Blue flame heaters, designed to be set in a fire-place, should not be used unless there is an effective draught in the chimney or flue to carry off the products of combustion. The committee has nothing to add to these conclusions.

SECTION V.—GAS TUBING AND CONNECTIONS.

The year past witnessed the advent of an improved flexible tubing, that consists of spiral metallic tubing, coated with a composition similar to that used in rubber tubing, and inclosed in a covering of fabric, so that it resembles ordinary rubber tubing. The spiral metal gives strength and durability, while the composition coating ensures freedom from the small leaks. It is a distinct step in advance in the interest of safety, and the committee advises gas companies to give this new-tubing a trial for portable room heaters. An incidental advantage is that the metal core permits the tubing ends to be more securely attached than is possible with rubber tubing.

There is great need for something safer than the ordinary slip-joint. The most promising joint seen is the "DeGray." This is a slip-joint, the two parts being held together by a bayonet-catch. Its important feature is a small spring valve, held off its seat when joint is made tight, but if the two parts of the joint separate, the valve will automatically close preventing any escape of gas. The mechanical details have yet to be perfected, but we speak favorably of it because, to set it as a safety device, no separate operation is required on the part of the consumer. If the consumer can make the joint without locking, the chances are he will neglect to lock it, but this joint cannot be made up without being simultaneously set as a safety device. Several other forms of safety joint have been inspected and it is possible one or more of them may be developed along practicable lines. On the whole the outlook is bright.

The committee repeats its warning against the use of the commercial form of independent cock, which, when inserted back of a bracket, brings 2 gas keys together. This is a prolific source of acci-

dent, and unjustifiable when the remedy, or means of greatly reducing the chances of accident, is so cheap.

Section VI.—Lighting Appliances.

The two most important problems affecting the extension of gas lighting in residence of the better class, are distance control and the discoloration of ceilings and walls. On the first of these we call attention to the paper contributed to this meeting of the Institute by Mr. F. H. Gilpin, and recommend its study to illumination departments.

Discoloration of ceilings and walls has received considerable attention in one illumination laboratory. This discoloration seems due to numerous causes, contributing in varying proportions. The diagnosis is accomplished, but the cures are complicated and difficult. The committee recommends this subject to the attention of gas companies contemplating research work in the interest of gas lighting.

Section VII.—Gas Fixtures.

The committee presents in Exhibit "A" a specification of gas fixtures which it recommends for adoption at this meeting. A preliminary specification was included in last year's report, which since then has been revised and completed and has the approval of the manufacturers. The cock is the part most in need of reform, for many now on the market are so poorly designed that the annoyance they are bound to cause is a serious handicap to the extension of gas lighting. The cock described in this proposed standard specification is a cure for this. It has been used for 2 years in Philadelphia, to the exclusion of all other designs, and has been cheerfully, even enthusiastically, adopted by leading manufacturers of fixture cocks, who report that its use is extending.

In other parts of the fixture, the aim has been to insure a sufficient gasway, which many modern fixtures, with their intricate passages, fail to secure; and to provide sufficient thickness in the walls of the tubing to insure gas-tight threads at the joints, and the requisite strength at these threads and throughout the fixture. These requirements have not been set too high; they are no more than expert opinion demands, and they do not materially increase the cost of fixtures. The committee recommends this specification as the standard of the Institute.

EXHIBIT A.

Proposed Specifications for Gas Fixtures.

General.—Gas fixtures should be of such mechanically good construction that proper installation, operation and maintenance will be assured without special difficulty,

Care should be exercised in the design of the fixture, so that no part of it interferes with ready access to any nut or screw, which it may be necessary to get at for purposes of adjustment.

Brass pipe or tubing should be either seamless drawn or brazed (in either case of best quality) to allow bending and threading without splitting.

The thickness of walls of brass pipe or tubing should be not less than No. 17 B. & S. gauge (0.04525 inch), except when used as casing or covering for iron pipe, in which case it may not be less than No. 22 B. & S. gauge (0.02534 inch). Iron pipe should be of the American standard size.

(While No. 18 gauge is very generally in use, it is believed that it is very much better to use No. 17-gauge. This is not because the 18-gauge tubing is not strong or rigid enough, but because, when threads are cut on it, there is not sufficient metal left to insure a good joint. If the 18-gauge always ran full size, or a little over, there would be no objection to its being used, but as it is necessary to allow some variation in the gauge of tubing, it is thought that the No. 17 should be specified.)

No. 1: Sizes of Threads.—(A) All threads on brass tubing should be straight threads of the size commonly known to the trade as "gas fixture" or "brass pipe" size; and should have, for ¼-inch and over, 27 threads to the inch. If less than ¼-inch, the threads to be 32 to the inch.

(B) All threads for iron pipe to be the standard iron pipe size. (Briggs' standard.)

(C) When brass and iron are connected, the thread should be iron pipe size (Briggs' standard), and when such a thread is cut on brass tubing, this tubing should be of sufficiently heavy wall to permit cutting a full thread.

No. 2: Assembling Requirements.—(A) All joints of stem, body-arms, cocks, nozzle, etc., to be threaded. No joints should depend on soldering or brazing to hold the parts together.

(B) The threaded portion of pendant body, or manifold, to be of such a depth that in no case will the stem come in contact with the arms. The body should be threaded for at least 5 full threads, both for the stem and arms.

(C) Fixture arms should not extend into the pendant body, or manifold, further than the threaded portion of the manifold.

(D) If the arms of the pendant are straight, the pendant body, or manifold, should be drilled in such a way that the arms will be perpendicular to the stem.

(E) The burner nozzle, or nipple, to have a ⅛-inch brass pipe, male thread. The length of this threaded portion should be not less than $\frac{3}{32}$-inch and not more than $\frac{1}{16}$, and the bottom of the thread should be recessed so that the burner will make a neat, tight joint, with the finished end of the arm immediately before the threaded portion.

(F) The axis of the burner nozzles should be vertical.

(G) Special precautions should be taken to prevent the obstruction of the gasways by foreign matter, such as fitters' cement, solder, or other jointing material, or metal chips. The ends of tubing should be reamed to remove burrs. When duplex tubing is used, care should be exercised to prevent faulty alignment of the gasways.

(H) Gas fitters' cement should not be used on any part of the fixture where it may be affected by heat from the burners. When solder is used it should be such that will not be affected by the heat from the burners.

(I) Fixtures for use out-of-doors, or in exposed situations, should be provided with suitable drips, or means for the convenient removal of condensation from any part of the fixture in which such condensation may accumulate. Independent pilot lines in outdoor fixtures should not be smaller than ⅛-inch iron pipe.

(J) Globe holders should be of such construction and weight that they will properly support, without sagging or bending, any globe or shade with which they are intended to be used. They should be readily and rigidly attached to the fixture arm or portable stand, and held in place by screwing down the burner, or by other means. They should provide a good seat for all parts of the globe with which they are supposed to be in contact.

(K) When a fixture has two cocks at the body, the cocks should be so placed that the keys will be at least 1 inch apart in the clear.

No. 3: Goose or Stork Neck.—(A) The thread on a fixed portion of a goose or stork neck should be not less than 5 full threads.

(B) The ground joint between the fixed and movable portions should have a bearing surface of not less than 1 inch, and the diameter of the small end of the ground joint should be not less than ⅜ inch.

(C) The joint should be thoroughly and properly ground, not merely tool finished. It should be gas tight without grease, under a pressure of 8 inches water column. (A water column 8 inches high is equal to a mercury column $\frac{5}{16}$ inch high, and represents a pressure of about ¼ of a pound per square inch.)

(D) It should be possible to lock the movable part to the fixed part by a bayonet lock, or similar means.

No. 4: Casing.—Where casing is used it should be cut to an exact length so that the joints may be made up tight, without marring or jamming the parts of the fixture at either end of the casing.

No. 5: Chain Pulls.—(A) Where a by-pass chain passes through a part of the casing, or an ornament of the fixture, the opening through which the chain passes should have an eyelet, or similar means, to prevent the links catching on the edges of the opening. If a rod is used in place of a chain, the eyelet may be omitted.

(B) If a chain pull is to be used, a sample of such chain should be submitted for examination and approval.

No. 6: Cocks on Portable Stands.—A portable should not have a cock as part of the stand.

No. 7: Swing Joints.—(A) Swing joint should be constructed in accordance with the specification for the fixture cock, in so far as that specification covers the plug, the gasway, the lock nut and jamb nut. It is understood that in no case shall the diameter of the plug at the small end be less that ⅜ inch.

(B) Fixtures having swing joints must be so made that the arms will, at all times, be in parallel horizontal planes, and the construction should be sufficiently heavy that the arms will maintain substantially those positions when a lamp of any weight up to 2½ pounds is attached. The deflection with a weight of 2½ pounds must not be over ½ inch. Exceptions: Fixtures intended to revolve in other than

horizontal planes, need not conform with this clause, but should be submitted for examination and approval.

(C) Swing joints should be so assembled that the weight of the fixture has a tendency to seat the plug in the body.

No. 8: Center Control Cocks.—(A) A center control cock, or the cock for controling the gas supply to a fixture having two or more arms, and which may or may not be at the same time a by-pass cock, should have in all cases a $\frac{3}{16}$ inch gasway, and in other dimensions should conform with the gas fixture cock specification.

(B) If this center control cock has lever arms, the latter should be of sufficient length to permit of easy operation, so that neither the arms, rods nor chains operating the cock come in contact with the body, arms or other parts of the fixture.

No. 9: Grease.—The grease used on cocks, or swing joints, should not contain resin, rubber, paraffine or similar substances. When the cocks are exposed to heat, as in the case of a by-pass cock over an inverted lamp, the grease should be made of a good quality of gas engine cylinder oil and graphite, in proportions of about 1 pound of graphite to 1 pint of oil. This grease is also preferred for all cocks. Where this lubricant is not used, a satisfactory grease is one made of beeswax and a good quality of tallow or lard, in the proportions of 3 parts of beeswax to 2½ parts of tallow or lard, with a small quantity of gas engine cylinder oil added to make the grease thinner.

No. 10: Sizes of Pipe or Tubing Used in Fixture Stems.

A: Length of Stem.	No. of Lights.	When Made of Iron Pipe. Cased. Inch.	When Made of Iron Pipe. Uncased. Inch.	When Made of Brass Pipe. Duplex. Plain. Inch	When Made of Brass Pipe. Tubing Chain. Inch.	Size of Gas-way Through Cock. Inch.
2′ 6″ and under	1	¼	¼	⅛	⅜	⅛
2′ 6″ and under	1-2	¼	¼	⅛	⅜	⅛
Over 2′ 6″ and under 3′ 6″	1-2	¼	¼	⅛	⅜	⅛
3′ 6″ and over	1-2	¼	⅜	⅛	⅜	⅛
Any length	3-4	¼	⅜	⅛	⅛	3/16
" "	5-7	⅜	½	¼	–	3/16
" "	8-12	½	¾	½	–	7/32
" "	Over 12	¾	1	–	–	¼

(B) "Length of stem" is understood to be the distance in a straight line from the stiff joint to the lowest point of the pendant. In the case of wall brackets, carrying more than one burner, the sizes given in the table are correct, except that no pipe smaller than ¼-inch should be used. In such brackets "length of stem" is understood to be the distance from the stiff joint to the point where the arms diverge.

(C) A one-piece (or harp pendant) if not over 2 feet 9 inches long, may be made of ⅛ inch iron pipe or ⅜-inch brass tubing. If longer than 2 feet 9 inches, it should conform to the table.

No. 11: Sizes of Pipe or Tubing for Arms.—(A) Arms of pendants, or of wall brackets, *i. e.*, those parts which carry gas for only one burner, should be made not smaller than the following sizes:

Length of Stem.	When Made of Iron Pipe. Cased. Inch.	When Made of Iron Pipe. Uncased. Inch.	When Made of Brass Pipe. Inch.
12″ or shorter	⅛	⅛	⅛
13″ to 18″	¼	¼	¼
Over 18″	⅜	⅜	⅜

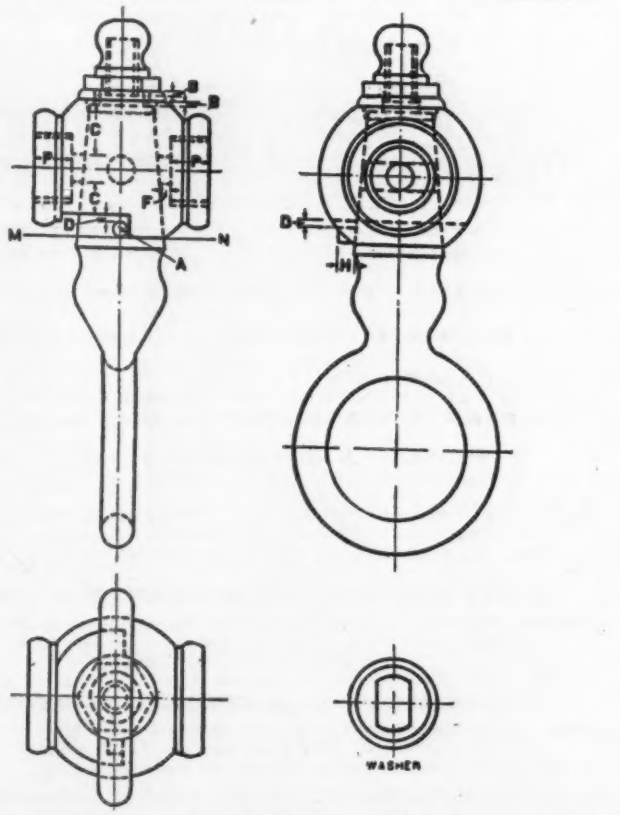
(B) "Length of Arm" is understood to be a distance measured as follows: In pendants—a straight line from the center of the stem to the center of the burner nozzle, in stemless wall brackets, like stiff brackets, or single-swing or double-swing brackets, carrying but one burner, a straight line from the stiff joint to the center of the burner nozzle, when the bracket has its maximum reach, in stemmed wall brackets, a straight line from the point of divergence of the arm to the center of the burner nozzle.

(C) In cast, wall-brackets, the area of the gasway in stems and arms should be not less than the area of the pipe, or tubing, of equivalent lengths of the sizes already specified.

No. 12: Cocks.—All cocks, including arm, center control, lantern, or any other shut-off cock, should be made in accordance with the "Specification for Gas Fixture Cocks." By "shut-off cock" is meant any cock intended to be used for completely shutting off the gas supply to a burner or burners.

Specifications for Gas Fixture Cocks.

It is not intended that this specification shall in any way govern the design of fixture cocks, except in so far as the dimensions given may govern the size. The accompanying drawing is merely conventional, and intended to show only the dimensions referred to in the specification.



(1) The material of both plug and body should be free from all defects, and of such grade that constant use will not cause excessive wear.

(2) The end of the plug should have 2 flat sides for the washer, and 2 nuts—a main and a jamb—should be used instead of a tail screw (Boston type). The plug, and the male thread on the end of the plug, should preferably be made of one piece; if of two pieces, the nipple forming the male thread on the end of the plug should be screwed, and sweated with hard solder, into the plug.

(3) The bearing surface for the washer on the cock body should be not smaller in diameter than the diameter of the washer. The washer should bear evenly on the face of the body.

(4) The plug should stop at 90° in either direction when shut off; but if a main by-pass cock, it may be ¼-turn cock. The plug should be carefully tool finished and thoroughly and properly ground.

Thorough grinding is of great importance; any sign of insufficient grinding will lead to the rejection of the cock. The cock should be perfectly gas tight, without an excess of grease, under a pressure of 8 inches of water column, while the plug may be turned by hand. The cock may be tested for satisfactory grinding by wiping the plug and body free from grease and putting on the plug a small quantity of dry red lead or chalk. The plug when turned in the body should then show no high or low places.

(5) For turned cocks, the thickness (F) of the body wall at the gasway should be not less than 3/32-inch. For cast cocks, the thickness of the body wall at any point, including the part that forms the miter, should be not less than 3/32 inch.

(6) The tapered hole through the body should be recessed at the small end to a diameter at least 0.003 inch larger than the diameter of the small end of the plug; this to prevent the formation of wear in grinding of a small end of the tapered hole in the body.

(7) The gas-way through both the body and the plug should be not less than ¼ inch in diameter, the gas-way in the plug to register with that in the body.

(8) Neither of the two distances (B), provided to take up wear, should be less than 1/32 inch.

(9) Neither of the two bearing surfaces (C), on either side of the gas-way, should be less than 3/16 inch thick.

(10) The distance (D), provided to take up wear, should be not less than 1/32 inch.

(11) The seal between the gas-ways in plug and body, when the key is hard over, should not be less than 3/16 inch in length.

(12) The stop pin (A) should be screwed or driven into place. If a driven pin is used, it should of soft annealed metal.

(13) Diameter of the stop pin: If a driven pin, not less than 1/16

(*Continued on page* 330.)

THE AMERICAN GAS LIGHT JOURNAL INC.

Entered at the Post Office, New York City, as Second-Class Matter.

Published weekly at 42 Pine Street, New York City.

Telephone Call, John, 2996. Cable, Am-Gas.

E. P. CALLENDER, President.
A. M. CALLENDER, Vice-President and Treasurer.
CHARLES H. WADELTON, Secretary and Manager.

THOMAS J. CUNNINGHAM, SANFORD K. CAMPBELL, } Editors.

Agents—American News Co., 11 Park Place, New York City.
Lemcke & Buechner, Berlin, Germany.
Aug. Siegle, 30 Lime Street, London, England.

TERMS OF SUBSCRIPTION.

United States, Cuba and Mexico, $3 per year. Canada, $4 per year. All other countries, $5 per year.
Single Copies, 10 Cents.

NOTICE TO ADVERTISERS.

New Advertisements and changes of copy therefor should be in hand Wednesday noon of week prior to date of issue.

NEW YORK, MONDAY, NOVEMBER 24, 1913.

BRIEFLY TOLD.

NOVEMBER MEETING, SOCIETY OF GAS LIGHTING.—The November meeting (Thursday, the 17th) was notable for the Society's action respecting its veteran member, Colonel Fred. S. Benson, with whom time deals lightly; in fact, not a spryer individual answers to roll call. And all this is truthfully said about a member of the fraternity who next Saturday will experience the 75th recurrence of his natal day. Respected, yea, loved by his comrades, he is to-day, so far as vitality and soldierly bearing go, second to none in the ranks of the Society of Gas Lighting, and the heartiest wish of his comrades is that his stay with them will be lengthy. Shortly after the regular business of the Society had been transacted, Dr. C. F. Chandler, who surely is also of the Old Guard, assumed the speaker's place, and, in appropriate speech, presented to the Colonel, on behalf of the Society, a beautifully designed loving cup of solid silver, bearing this inscription:

Presented
to
Col. Fred. S. Benson
as a Token of Love and Affection
by the
Members of the
Society of Gas Lighting,
1838—November—1913.

The Colonel is not much of a speechmaker, but in this instance he developed unthought of eloquence of expression in gratefully acknowledging this evidence of esteem. In swift sequence came another donation chapter. This time it was Doctor Chandler's turn (he has been on the Society's listings since May, 1876), who received from the hands of that other well-loved veteran gas man (Mr. Alexander H. Strecker), a box of especially made cigars, of his favorite mark, each encased in a covering carrying his name, and the dates, 1876-1913. Having made an appropriately witty acceptance, short, relevant and fraternal speeches were made by Chief William H. Bradley, Dr. A. C. Humphreys, Capt. William E. McKay, Mr. Walter R. Addicks and Mr. Charles H. Nettleton. The meeting and subsequent dinner were brought off in the Yacht Room, the Hotel Astor, which was beautifully decorated for the occasion. To show the surpassing interest that was manifested in this meeting of the Society, it is only necessary to note that virtually two score of the members participated in the proceedings.

A REMINDER OF A CENTURY AGO.—Herewith we give a reproduction from the issue of the "Columbian Phenix: or Providence Patriot," bearing date of "Providence, Saturday Morning, November 27, 1813." To complete the reference record the Number of the paper is 46; and its Volume Number is 11. It tells its own story volubly and well, and it further positively proves that the Messrs. David Melville (Newport, R. I.), and Winslow Lewis (Boston), constitute the first firm in the United States to engage in the business of installing gas plants.

GAS-LIGHTS.

THE ſubſcribers, Proprietors of Letters Patent from the Preſident of the United States, for the IMPROVED GAS-LAMP, for lighting Manufactories, Mines, Mills, Theatres, Light-Houſes, and other Buildings, with Hydrogen Gas, or inflammable air, produced from Pit Coal, in a more agreeable, more ſafe, and leſs expenſive manner than has hither.o been done by any other method, having it now in operation in a building in Newport, R I. and in the Cotton Manufactory of Mr. *Seth Bemis*, in Watertown, (ſeven miles from Boſton) which is now brilliantly illuminated every night with Gas Lights, to the excluſion of every other artificial means, they reſpectfully invite gentlemen concerned in manufactories, &c. to call and view it in operation, and be convinced of the utility and advantages of this improvement. The Gas apparatus is very ſimple in its conſtruction and to enſure its management, that any perſon of ordinary faculties may be taught in one or two operations, to manage every part of it effectually; and the trouble will be found infinitely leſs than that of trimming and tending lamps or candles to afford the ſame number of flames.

The Gas-Lights are in no way offenſive, but very agreeable to the eye, and will be found extenſively uſeful in every ſituation where much light is required, eſpecially in *Cotton* Manufactories, inasmuch as they are leſs expenſive than thoſe from tallow or oil, and free from the inconvenience and danger reſulting from the ſmoke and frequently ſnuffing of lamps and candles; circumſtances tending greatly to diminiſh the hazard of fire, and proportionably to reduce the rate of inſurance on buildings and materials ſubject to that deſtructive element.

Contracts will be entered into for furniſhing and putting up the apparatus in manufactories, &c. immediately, on terms highly advantageous to them, by applying to

DAVID MELVILLE, *Newport*, or
WINSLOW LEWIS, *Boſton*.

November 13.

N. B. The Gas Apparatus has juſt been erected under the ſuperintendance of the Patentee, at the WENSCUIT MANUFACTORY, (one and a quarter mile from the Mill Bridge) which is now illuminated every Evening with Gas Lights. Gentlemen concerned in Manufactories in this vicinity, are reſpectfully invited to call and ſee this valuable improvement in operation. An Apparatus for any number of lights can be furniſhed in ten days after application as above.

Providence, Nov. 13th, 1813. 6w.

WAR FOR OIL.—The world has knowledge that wars always stop as soon as the financial powers say the word, and now there is ground for thinking that wars are sometimes started or continued for commercial reasons. The present Mexican troubles are being persistently charged to the activity of the petroleum interests and the subsequent English quasi-endorsement of the Huerta regime, because of its relations to the Pearson's syndicate and Mexican Eagle Oil Company. The latter Pearson subsidiary was organized during the Diaz administration, and, in addition to its oil land leases, it controls the oil pro-

duction on hundreds of thousands of acres of government land. The Maderos are credited with having wished to develop some of these lands for themselves, Huerta meanwhile being said to be in sympathy with the present holders. The direct interest of the English government is from the fact that it is with the Mexican Eagle Oil Company that it has placed its contracts for fuel oil for the new dreadnaughts.

"Gas Meeters'" Night.—The evening of Thursday, December 4th, during the Philadelphia session of the National Commercial Gas Association, has been designated as "Gas Meeters' Night," and is to take the place of the usual banquet. It will be informal, as are all the "Meeters'" dinners, and is to be served in the Continental Hotel's Winter Garden, Ninth and Chestnut streets, at 6:30 P.M. An extensive programme has been arranged, including an elaborate entertainment, and as the number of tickets is limited, those proposing to attend would do well to get their billettes as soon after arriving in Philadelphia as possible. This is the first opportunity that the "Meeters" have had to get together all the Sections at an annual dinner, and it will likely be made a permanent feature of N. C. G. A. meetings. Every man in attendance at Philadelphia should try to get in on this. Only those who act promptly can be sure of their ground. Ask anyone wearing a "Meeters" button for the necessary ticket.

Fall Meeting of the "Gas Meeters," New England Section.—The initial fall meeting, Boston Section, the "Gas Meeters," was held at Taunton, Mass., Thursday, November 13. Preparatory for this meeting an invitation was extended by the Weir Stove Company, makers of the Glenwood gas range, to visit their factory and to be their guests at a dinner at the Wampanoag Motor Club. Leaving Boston (at 12:30) on a special car, the Glenwood plant was reached about 2 P.M. The afternoon was spent in viewing this large and complete stove foundry, and the inspection proved decidedly interesting to all. The party was conducted through the various departments of this largest stove factory in New England, by Mr. R. M. Leach, General Sales' Manager, Mr. J. L. Anthony, Superintendent, our genial friend Abbott, the New England representative, and Mr. R. H. Babbitt, Jr., the Advertising Manager. Mr. James H. Boyd, of the Taunton Gas Light Company, was in evidence everywhere, looking after the welfare of the guests. After the inspection of the plant, the party rode in automobiles to the Wampanoag Motor Club. Dinner was served at the Club House, and it will long be remembered by those who shared its joys, not only on account of its general excellence, and the entertaining features introduced, but for the "good fellowship" individually and collectively manifested. At its end the usual rising vote of thanks was waived, but three rousing cheers for the Glenwood people were given instead. At the conclusion of the dinner, Chairman and Toastmaster (Mr. Frank W. Jennings, of South Framingham), introduced Mr. Anthony, who gave a short talk on the methods of manufacture followed in the plant of the Weir Stove Company, and Mr. R. M. Leach, General Sales Manager, followed with a few interesting remarks on the general sales' end of the business. Mr. M. E. Abbott, the New England representative, and Mr. R. H. Babbitt, Jr., the Advertising Manager, made some remarks pertaining to their sections of the business, and Mr. N. W. Gifford, Secretary, New England Association of Gas Engineers, delivered some pithy remarks from the gas man's standpoint, as to the value to the gas companies in pushing high grade goods. During the evening they were entertained with songs, by Messrs. Moran and Neafsey, of the Brockton Gas Light Company; by "Eddie Knapp," New England Representative of Wm. Kane Manufacturing Co.; and by "Johnnie" Brown, who from the celebrated "Fallé Riviera Opera Company," of Fall River, was in evidence with a few selections. All of the numbere were finely rendered and enthusiastically received, and when the 94 "Gas Meeters" were seated for dinner, there was something doing every minute. The party left the Clubhouse at 7:30, seated in automobiles, for a trip around the city, which was beautifully decorated for the happenings of "Merchants' and Old Home Week." The trip at an end, the voyngers were taken to the station to board a special car for Boston, tired but happy. The entertainment given the "Gas Meeters" by the Glenwood people will be long remembered as a gala event in the history of the Boston Section.

CURRENT MENTION.—

"H. M. F.," writing from Revere, Mass., under date of the 19th inst., says: "The local Employees' Association of the Suburban Gas and Electric Company of Revere and Winthrop, Mass., held its third monthly meeting, Tuesday evening, November 18th, in the well-appointed Club Room. A bountiful supper having been served and disposed of, the special guest of the evening (Mr. John West, Manager of the New Business Department, the C. H. Tenney Company) read a very interesting paper on the subject of "Our Relations to the Public," that abounded in telling points. The Question Box was then taken up, and its contents brought out a good discussion on many timely matters. The meeting was by far the best one during the current year."

The Philadelphia Section, Illuminating Engineering Society, in its arrangings for December, announces that the meeting will be held the 8th prox., and that it will be a joint affair with the Philadelphia Section of the American Institute of Electrical Engineers. The programme calls for these papers: "Brightness Measurements *vs.* Illumination Measurements," by Dr. Herbert E. Ives; "Railway Car Lighting," by Mr. George H. Hulse; and "The Mercury Quartz Tube Lamp," by Mr. Buckman.

The Nelson (B. C.) Gas and Coke Company's plant has been ordered purchased by vote of the property owners. The total vote cast was 490, of which 401 favored the proposition. Nelson now owns and operates an electric plant, a gas works, a water works, and is negotiating for the purchase of the street railway system.

The Borough Council, of South River, N. J., has granted permission to the Public Service Gas Company, of New Jersey, to pipe the streets for a gas service. If this thing actually materializes, Mayor Fee should be given credit for bringing it to pass.

Messrs. T. C. Krasley, C. S. Rietz and C. H. Stead, on the first prox., will appear before the Governor of Pennsylvania to incorporate the Red Hill Gas Company, to manufacture and supply gas to the residents of Red Hill, Green Lane, East Greenville, County of Montgomery. Dallas Dillinger, Jr., of Allentown, Pa., is the attorney.

The action of Corporation Council Hammond, who has taken an appeal from the decision of Mr. Justice Woodward, whose recent order vacates the injunction issued to the city against the Buffalo (N. Y.) Gas Company, from shutting off the gas supply on city account, unless the back accounts were settled in 30 days, savors very much of oppression. The Public Service Commission has fixed the rate of settlement at 90 cents per 1,000 cubic feet, and the moneys in dispute (rather that are retained), are owed for bills incurred years ago.

"T. L. M.," writing from Joplin, Mo., under date of the 15th inst., says that, if the decision rendered by Justice J. D. Perkins, in Division No. 1, Circuit Court, is upheld, the Joplin Company will have to pay the debt incurred by the city last winter in retaining an expert and a special attorney to assist the city's legal department to defend a suit brought by the Company to have declared void an ordinance regulating the rates that the Company might charge. The bill in contention foots up to $1,875.

Amongst the vessels lost in the recent terrible storm on the great lakes, that of the Isaac N. Scott is reported. The vessel was bound from Toledo, O., to the Milwaukee Coke and Gas Company, loaded with coal for the named corporation. The Scott's crew numbered 28 men.

The Scott Investment Company and W. H. Harrison, Jr., of Birmingham, Ala., are the parties in interest respecting the construction of a gas plant in Waycross, Ga.

The Bay State Gas Company, Wilmington, Del., and elsewhere suffered a brief resuscitation, when (at noon of the 18th inst.) it convened itself, in Wilmington, Del., in annual meeting. We are authoritatively informed that the "retiring management was re-elected, without opposition." Noble men, these; in fact, their motto should be, "*Fide et fortitudine!*"

The December meeting, Chicago Section, Illuminating Engineering Society, will be held the evening of the 10th, at the residence of Mr. A. D. Curtis, 5528 East End avenue, and it will be known as "Ladies' Night." Mr. Curtis is to present a paper giving "Five Years' Progress in the Indirect Lighting of the Home," and the author will demonstrate its paragraphs by means of "spot" examples.

The situation at Americus, Ga., is further complicated by the organization of a concern to operate a combined gas, electric light and power plant, capitalized in $300,000. The lighting situation in that city has always been in an involved condition.

(*Continued from page 327.*)

inch; if a screwed pin, not less than 3/32 inch. No portion of any 1\16 inch diameter pin should extend below the miter—*i. e.*, below the line MN.

(14) Length (H) of the top pin should be not less than $\frac{1}{16}$ inch.

(15) The key and the gasway should be straight on the axis of the body when gas is on.

(16) The key and the plug should preferably be formed of one piece of metal; if not, the two pieces should be firmly attached by sweating with hard solder.

(17) The cock body should have at the screw point (P) not less than 5 full threads.

Coal Liming.

By Mr. Thomas Holgate.

[From a report of an inspection of the works of the Cheltenham Gas Company, made at the request of the Editor of the *Gas World*, to obtain the results of further experience with the process of coal liming, patented by Mr. R. O. Paterson and Mr. Twycross, an outline of which, together with working results up to that date, were given in a paper read by Mr. James Paterson, before the Southern District Association of Gas Engineers and Managers 2 years ago.]

When the metropolitan gas companies obtained the abrogation of the clauses in their Acts of Parliament defining the limits of organic sulphur permitted in the gas supplied, Mr. Paterson decided to follow that precedent, principally because of the difficulty in getting rid of the spent lime. His Company, therefore, went to Parliament and obtained authority to use the No. 2 Metropolitan burner, and the removal of the penalties on the sulphur content of the gas. The change to oxide purification involved alterations to the purifiers, and when later he found the sulphur content higher than he wished, return to lime purification was barred by what he had done in modifying his purifiers. Realizing that the sulphur in the gas was greater than had been expected he sought means to reduce it, believing that the increased sulphur was due to the altered modes of carbonization, rather than to any great difference in the sulphur present in the coals used.

Having had experience with the Cooper-Wanklyn process, he turned his attention to improving it, and applying it in a simple manner. The conditions necessary are (*a*) Fine division of coal and lime; (*b*) regular proportioning of the latter to the former; (*c*) the lime to remain as oxide of calcium until mixed; (*d*) hydration of the calcium oxide by steam, sufficient to cause adherence to the surface of the coal. The steam is applied in two stages, at the boot of the coal elevator or breaker, and in the overhead hopper containing the limed coal. Two per cent. of powdered, unslaked lime is found sufficient to reduce the organic sulplur in the gas by one-half; and does not effect the coke produced. The lime is ground in a mortar mill, and then elevated into a hopper over the mouth of the coal breaker. From this hopper is a shoot containing a roller adjustable to leave a clearance space sufficient to feed the requisite powdered lime. About 8 cents per ton of coal cover the cost of liming, and one-half of this comes back in coke revenue, if the market value of the coke be not depreciated.

Mr. Paterson thinks all the expense is neutralized by the gains in carbonization; and that elimination of a large part of the sulphur from the gas is effected without any cost. The gains in carbonization are an increased yield of gas per ton of coal, and a great reduction in the number of stopped ascension pipes. The make of sulphate of ammonia is probably increased by the process, but, owing to variations of the coal supply, this cannot be stated with certainty; no alteration either way is noticed in the tar made, and the cyanogen compounds are not abstracted from the gas. The quantity of sulphureted hydrogen to be removed by the oxide is about one-tenth less when using limed coal—that is, when unlimed coal is used about 1.0 per cent. by volume, and when limed 0.9 per cent.

The make of gas per ton during 1911, when all the coal was limed, was 13,473 cubic feet, registered at the meter, without correction for temperature or barometric pressure. Accounted for was 12,720 sold and 182 used on works, a total of 12,902 cubic feet, with an average illuminating power of 15.25 candles, in the No. 2 Metropolitan burner. Figures for 1912 confirm those for 1911, as do those for the current year. The gain in gas per ton is connected very closely with the question of stopped pipes. The No. 1 station is equipped with horizontal retorts, 24 inches × 13½ inches and 22 inches × 16 inches cross section, 10 feet lengths, with stopped ends. Eight retorts per setting are arranged, two in the bottom tier and three in each of the two other tiers. Tests by a Féry pyrometer show temperatures between 950° and 1,000° C., according to position in the setting, the temperature being that of the retort just after the withdrawal of the coke. The furnaces are clinkered every 48 hours.

These retorts have 6-inch ascension pipes, and connect to a dry main, having on each pipe a butterfly valve, opened and closed by a rod coming down to the mouthpiece. The amount of pull upon these pipes is regulated at the exhauster house, beyond the condensers and a tar extractor. The seal in the tar extractor and the friction in the condenser have necessarily to be allowed for, in determining the adjustment of the exhauster. The pull is shown by a gauge reading to hundredths of an inch, with variations of small amplitude. Thus obstructions to the flow of gas from the retort are avoided, and oscillations of pressure such as from an hydraulic main. To that, whether limed or unlimed coal is used, the conditions of the overhead main are favorable to a high yield of gas. Most of the data have been ascertained in the No. 1 station, where charges are 2½ cwts. per mouthpiece every 4 hours 48 minutes, while in the No. 2 section 8 hours is the duration and 4 cwts. the weight of coal per mouthpiece. It is believed that certain advantages may accrue by this latter method, but they have not yet been clearly formulated.

The first question that arises is how much of the increased yield of late years is due directly or indirectly to coal liming? As to direct gain, the evidence is somewhat uncertain, but for the indirect, there is a good deal to be said. The carbon on the retorts was not great when using unlimed coal; but now it is even less; the number of stopped pipes is very considerably less, stoppages being now almost unknown; no regular pipe-jumpers employed, the men formerly so occupied having been taken off. The writer saw full length ascension pipes and bends taken off retorts and now laid in the yard free from obstruction, and the substance upon the inside of the mouthpiece lids, and upon the inside of the mouthpieces themselves, was non-adherent, and not like the hard, ingrained, pitchy substance which usually gathers there when high distillation temperatures are employed. By the absence of these stoppages higher retort temperatures may be used without unpleasant results, and in this way the higher rate of gas production is explained. But when we ask how the lime acts upon the coal to effect this change no explanation can be given. The technical staff at Cheltenham are quite sure of the facts, the explanation of the *modus operandi* alone being needed for further progress. To say that it is an impossibility for the presence of lime to affect either the quantity or quality of gas per ton of coal would be unwise.

There is not any complete chemical explanation forthcoming as to how the lime reacts to prevent the formation of organic gaseous sulphur compounds. It is, of course, known that the distribution of the sulphur from coal is not always upon the same lines; that a larger or smaller percentage of the sulphur content may be found in the coke, the tar, the ammoniacal liquor, or in the gas; and that the gaseous sulphur compounds may vary in their ratio of sulphureted hydrogen to organic sulphur components. Obviously this ratio will be affected by conditions of distillation, and in face of the recent success of coal liming, it appears to be highly probable that a series of tests thereupon would be helpful towards a higher efficiency.

Retort house operations do not appear to be impeded by adding lime to the coal; but, on the contrary, the interior appearance of walls and roof is perhaps less black than when using coal only. A sample of coal taken from the manual charger showed the pieces to be uniformly coated with finely divided lime, not likely be shaken off in charging the retort. The coke used in the producers loses some of its lime, and this is carried into the flues of the settings, so far without injury thereto, only needing an occasional raking out. The remainder is in the clinker and ash. The yard heap of ashpit refuse showed a number of large clinkers, mixed with a much greater quantity of ash, smaller clinker and some incompletely burnt coke, as is usual. The clinker from the boiler fires showed, not a fused mass, but an aggregation of sharply defined parts, showing that the lime present had not acted as a general flux. In the clinkers from the producers there was nothing like fluxed brickwork, and no evidence of the viscous condition having been passed through. The observed ash and clinker from a grate cooled by water were in the ashpan.

The coke taken for sale amounts to 10 cwts. per ton of coal, and sells at a price higher than some of the Leicestershire coals sold for domestic use. This shows that the coke is not seriously deteriorated by the

presence of 2 per cent. of lime in the coal or 3 per cent. in the coke, so far as domestic and greenhouse uses are concerned, for these are the typical uses in the district. Presumably the coke contains more sulphur also, and possibly represented by the compound $CaSO_4$ (calcium sulphate), which, on burning of the fuel, would not give off any more sulphur than the unlimed product. But as to the ultimate chemical facts one can not speak positively. The coke examined in the yard shows no lime, and when used in a grate it seems to burn more freely than the unlimed product, for it appears to slightly disintegrate.

The general result on the comparison of the gas points to a reduction of the organic sulphur from 44 grains to 21 grains with a Derbyshire coal, and a reduction from about 50 grains to 24 grains with a South Yorkshire coal. Using the latter coal for the first 6 months of 1913, the percentage of H_2S in the crude gas was 0.9, and in the purified gas the average organic sulphur was 24 grains, with a maximum of 27. As experience has shown that anything under 25 grains is satisfactory, they have not increased the percentage of lime, although it could be done with a corresponding reduction in the sulphur compounds in the gas.

The use of gas of such a sulphur content leaves the fittings in most cases uninjured. The interior surfaces of condensing heating stoves remain comparatively undamaged, and in every way the appliances in the district are in much cleaner condition than they would have been had the coal not been limed. On pendants having inverted burners, where the products of combustion were liberated sideways, no discoloration could be noticed, but I saw two where the gases were discharged under the arm, and there was a discoloration.

The troubles from organic sulphur compounds have been surmounted or very largely alleviated at Cheltenham, and we must inquire how far this success may be expected elsewhere. The statement already made as to the factors contributing that success will give a basis for general considerations.

The factors, more crucial than others, are: Will the same ratio of diminution of sulplur compounds occur with other coals? There is a strong probability of this being so, because from May, 1910, to the present time several varieties of coal have been used, and in no case has it failed. Secondly, as to the effect of the lime upon the coke for disposal. No further test is needed than the Cheltenham one for the ordinary uses of coke, but other uses, such as welding, smithing, brass and iron melting must be remembered. If the lime needed for efficient gas results is found injurious to the coke for trade uses, arrangements for the separate distillation of unlimed coal therefor could be made, or that part of the coke trade would have to be sacrificed to the interests of the gas supply. Obviously it is desirable to make the lime as effective as possible, as the lower the percentage required the less difficult becomes the coke question. Minute subdivision must tend to make the lime more effective, and, therefore, the Cheltenham mode is distinctly superior to those tried by Cooper, Wanklyn and Spice. At the same time, sub-division of the coal, which is now more generally practiced, must contribute something to the success achieved; and if carried further would conceivably do more. It is clear that the work done at Cheltenham has narrowed the problem and made it possible for any engineer to readily ascertain what is needed for the application of limed coal to his conditions.

No chemical investigation has been made at Cheltenham as to how the increased gas yield is obtained, but it appears that the researches of M. Leo Vignon throw much light upon the subject. He finds that lime has an important influence upon the generation of hydrogen and hydrocarbons as well as carbon monoxide, when present along with carbon, moisture, etc. That while the ordinary water gas reaction ($C + H_2O = CO + H_2$) proceeds at a high temperature, say 1,000° C., it is only possible by the *absorption* of heat, to the extent of 29.1 calories per gramme-molecule. The endothermic reaction takes place also in coal distillation, when the temperature has risen sufficiently, which will ordinarily be the case on the inside of retorts heated by present day methods. In contrast to this absorption of heat, he finds a liberation of heat when lime is present. What takes place when water vapor acts on an intimate mixture of carbon and lime depends upon the ratio of the masses thereof, and is expressed in the following set of equations:

$C + CaO$ (quicklime) $+ 2H_2O = CaCO_3$ (calcium carbonate) $+ 2H_2$, the heat disengaged being 25 calories.

$C_2 + CaO + 2H_2O = CaCO_3 + CH_4$ (methane), the heat disengaged being 47 calories.

$3C + CaO + 2H_2O = CaCO_3 + C_2H_4$ (ethylene), the heat disengaged being 17 calories.

These reactions appear to explain the increased make of gas per ton, for they show how the presence of calcium oxide may help the formation of useful gases at a lower temperature, and also furnish heat to assist the general distillation. The ultimate explanation of this favorable action is the heat liberated by the conversion of calcium oxide into carbonate, just the converse of what takes place in the limekiln. There the heat has to be supplied to drive off carbon dioxide from the calcium carbonate.

Beyond this, carbon monoxide is also formed by the interaction of methane (CH_4) and water vapor. In some of the experiments where steam was passed over lime and carbon, at 600°-800° C., the proportion of methane varied from 7.92 to 28.05 per cent., according to the amount and rate of flow of the steam. Various observers have shown that when carbon monoxide is passed over heated sodium or potassium or calcium hydroxide, a formate of these elements is produced, and that on further heating hydrogen is evolved. In an investigation into this phenomena M. Vignon found that, with lime and carbon monoxtde, at a temperature between 350° and 400° C., considerable quantities of methane, ethylene and hydrogen are formed, and that from 400° to 600° C. the quantity of hydrogen increases at the cost of the hydrocarbons. The reactions taking place are probably represented by the following equations:

$2CO + Ca(OH)_2$ (calcium hydroxide) $= (H.CO.O)_2Ca$ (calcium formate) $= C_2O_2(O)_2Ca$ (calcium oxalate) $+ H_2$

$2(H.CO.O)_2Ca + CaO$ (quicklime) $= 3CaCO_3$ (calcium carbonate) $+ CH_4$ (methane)

$4(H.CO.O)_2Ca + 2CaO = 6CaCO_3 + C_2H_4$ (ethylene) $+ 2H_2$

Experiments in heating calcium formate, or oxalate alone, or mixed with lime, confirm this explanation of the origin of the hydrocarbons. Carbon monoxide may be converted into hydrogen and hydrocarbons to the extent of 99.5 per cent. by passage over hot lime several times, and it is suggested that in such way town gas might be freed from this toxic constituent. To do this for water gas, it is only necessary to pass it through a mixture of slaked lime and quicklime in closed vessels at 400° C. If the pressure be raised to 2 or more atmospheres, methane is formed at lower temperatures, and the secondary reaction $CO + Ca(OH)_2 = CaCO_3 + H_2$, which proceeds more rapidly at higher temperatures, can be avoided. The lime need then be heated only to 100° to 200° C.

Observations by other chemists confirm the explanations given by M. Vignon. For instance, Gautier has shown that small quantities of methane are produced by the action of hydrogen or carbon monoxide at 400° to 1,200° C., and Clément and Désormes and Langlois have all observed its presence in water gas made from coke. Vignon, using sugar charcoal, found that very little marsh gas was yielded, but with coke the yield was unmistakable, and increased with the percentage of lime in the coke, original or added. The lime present acts as a catalyst in reactions, which show the methane in water gas to be generated as follows:

(1) $4CO + 2H_2O = 3CO_2 + CH_4$.
(2) $2CO + 2H_2 = CO_2 + CH_4$.
(3) $CO_2 + 4H_2 = CH_4 + 2H_2O$.

(The equations agree with those deduced by Sabatier and Senderens when using reduced nickel as catalyst and working at lower temperatures.)

The lime present in the coke plays an important part in the above equations, which refer to operations conducted at 1,000° C., the temperature of the dissociation of calcium carbonate being 900° C. As shown in preceding equations, at and below 800° C., the formation of calcium carbonate is also an important factor.

Coal Mine Accidents.

The compilation by the U. S. Bureau of Mines, regarding "Coal Mine Accidents in the United States and Foreign Countries," just issued, shows that, during 1912, 2,360 men were killed in coal mines in the United States as compared with 2,719 in 1911, and that the fatality rate was lowered, from 3.73 in 1911, to 3.15 per 1,000 men employed in 1912. From 1896 to 1907 the number of men killed per 1,000 employed gradually increased with only slight fluctuation; the number killed per 1,000,000 tons also increased, but fluctuated over a wider range.

During this 12-year period the increase in the death rate was accompanied by an enormous increase in the production of coal. In

1896 the outp ut was 191,986,000 tons, and in 1907 it was 480,363,000 tons, an increase of over 150 per cent. In 1896 each man employed produced 2.64 tons coal per day, whereas in 1907 the daily production per man was 3.06 tons, an increase of 16 per cent. Since 1907 there has been a marked decrease in the number of fatalities at the coal mines, brought about by a combination of causes, the principal one being the more effective mine inspection by the State mining departments and the State mine inspectors throughout the country, supplemented by greater care of both operators and the miners. The investigative and educational work of the Bureau of Mines has kept them alive to the dangers connected with coal mining, and brought out the precautions to be taken to avoid these dangers. As a result of this education, mining companies are organizing safety committees, providing emergency hospitals, and training men in first-aid and rescue work, so that they are equipped to cope with any ordinary accident. The fatality rates in foreign countries, from 1901 to 1910 inclusive, are as follows:

Great Britain, 1.36 per 1,000 men employed; Germany, 2.11; France, 1.69; Belgium, 1.02; Japan, 2.92; Austria, 1.04; India, 0.96; New South Wales, 1.74; Nova Scotia, 2.65; while the rate for the United States was 3.74. The low rates in foreign countries may be accounted for by the fact that coal mine inspection has been enforced longer than in the United States. In Great Britain coal mine accident statistics have been collected and studied since 1851; in France, since 1853; Austria, 1875; Germany, 1852; Belgium, 1831.

Of the larger disasters in the United States, gas and coal dust explosions caused 183 accidents and 5,111 deaths, or over three-fourths of the total number of men killed. The next greatest number of deaths were from mine fires—1,082—over 15 per cent. of the total number killed. Thus gas and coal dust explosions and mine fires account for more than 90 per cent. of the men killed in these large accidents, although falls of roofs or walls claim nearly 50 per cent. of the total fatalities.

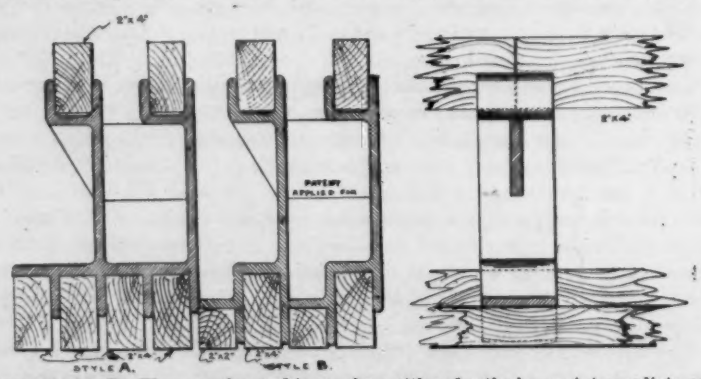
New Methods and Appliances.

Improving Purification Conditions.—There are other ways of getting better and cleaner gas than by simply increasing the activity and efficiency of the purifying material. At this season the gas man must take extra precautions in handling his gas, otherwise the clerk at the switchboard will find it impossible to care for the complaints. When the first cold snap comes all doors and windows are kept closed, and the hot-blooded colored cook, after warming her feet in the oven, will generally proceed *pronto* to stuff rags, paper and good linen dusters into cracks and crannies around windows and transoms. If there is a trace of H_2S in the gas it will show up under these conditions. When the northeast winds hit the purifiers and other plant, something interesting happens. You are likely to get all sorts of main and service troubles, whether or not careful. These complaints we have always with us in winter time. Why seek others?

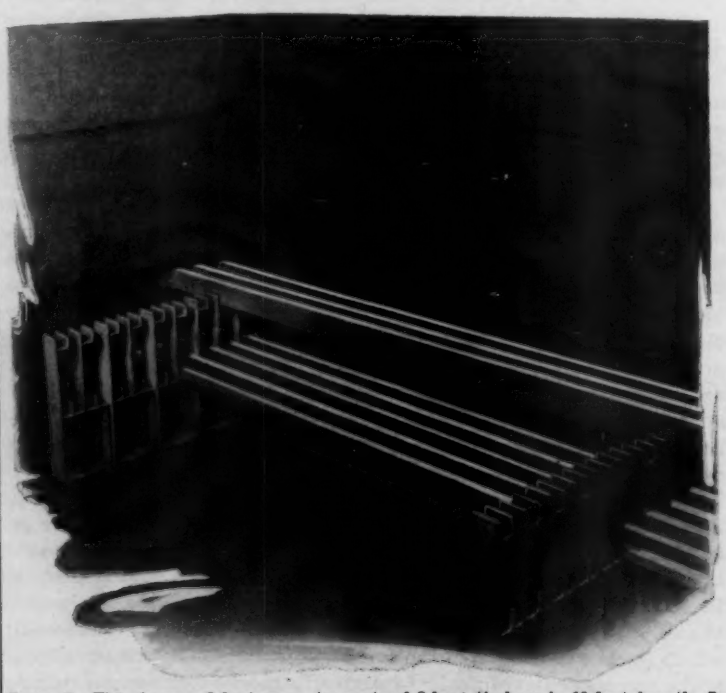
However, much can be done to keep down complaints, if one only looks ahead. Get busy on all exposed mains in the plant, and cover them with good non-conducting material. That will keep down naphthaline troubles, and assist in preventing the formation of pitch. Keep your eye on temperatures, and you will put in less footwork around the choked plant and troublesome distribution system. Especially are the purifiers subject to derangement when the snow flakes begin to fly. This, too, for reasons other than the one of critical temperature being difficult to maintain between the gas and the oxide. That is an important point, and you can look after it without much trouble. If you have no steam coils in the boxes, you may turn live steam under the grids—not too much, of course. Watch your pressures is another slogan we should observe. Really watch them. not only taking perfunctory glances at the pressure gauges. Get busy, first of all, and clean out the connections; then put in a good anti-freezing solution in the gauge glasses, selecting something with gravity about equal to water.

Low temperatures before the purifiers mean much that will militate against good results from "Ferox," or any other purifying material, even if you boost up the temperature again before the gas enters the material. Why? Because, although it is necessary to remove all tar, and advisable to get out all ammonia before the gas reaches the oxide, it is not a good plan to remove all the moisture. The purifiers, when filled with gas that will drop out some moisture (or will act so well that a proportion of water is liberated from the oxide) will act better, for then the oxide will not cake and get hard. Always try to keep the oxide moist. The best way to do this is to run gas down instead of up; but if you cannot do that, you can at least use just enough steam with the gas to raise the temperature 15 to 20 degrees without making the oxide "soggy."

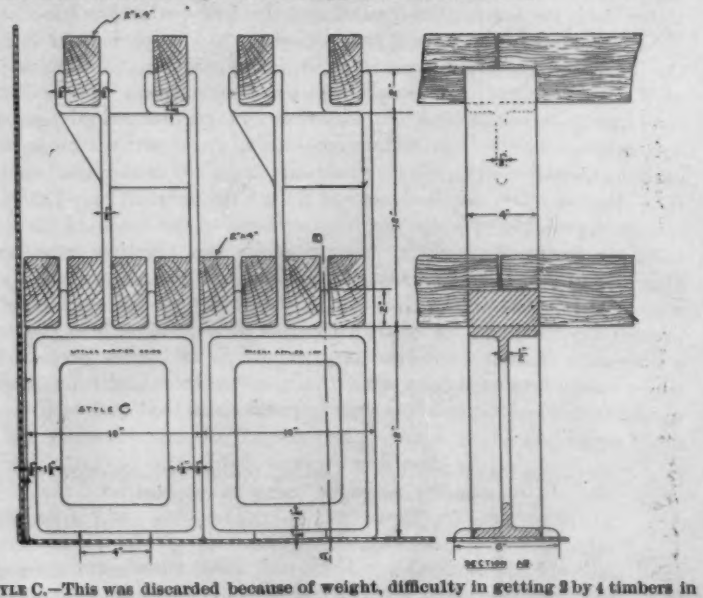
However, even the best one can do will hardly be good enough, because the present forms of grids or trays lend themselves to pack-



Styles A and B.—These can be used in any box, either for the lower, intermediate or upper sets of trays. The timbers rest on the frame which is used for supporting the ordinary style tray. Style "A" is for use where 2 by 4-inch timbers are adopted throughout, and style "B" is for use where, on the lower row, you alternate 2 by 2 and 2 by 4-inch timbers.



Style C.—This shows a 9-foot span—two sets of 2 by 4 timbers in 13-foot length—Intermediate Support. When the new style A grids were put in this box, 2 by 4 timbers 13 feet 10 inches long were used, supported on the ends only.



Style C.—This was discarded because of weight, difficulty in getting 2 by 4 timbers in lower row, and by reason also of cost.

ing, whether the oxide is a little too dry or is made a trifle too moist. For this reason we have satisfaction in introducing a new style of trays, which seems to possess many advantages over the old patterns, even including the "hurdle" or step grids, such as Jaëger, Spencer and Cutler, used so extensively in Europe at considerable cost for grids and up-keep.

The inventor, A. S. B. Little, of Nashville, Tenn., makes several claims for it, and we are inclined to consider many of them can be substantiated. He has furnished us with the following information, which we print in the hope that it will lead to improvement in purification methods. We understand the invention is fully protected. The new grids are described in the patentee's own words as follows:

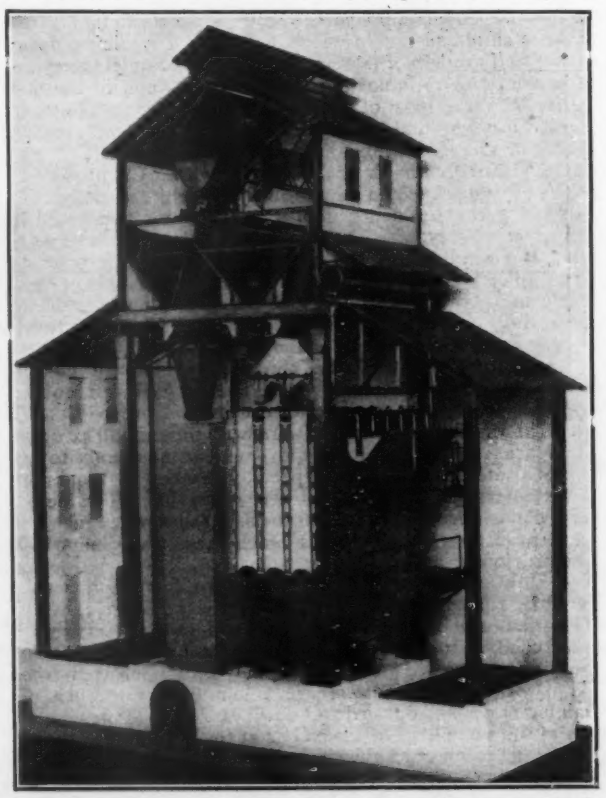
I believe I have seen every kind of purifier tray, grid or sieve in use, and in every case there seemed much to be desired in the way of improvement. After experimenting with many forms, trying to improve same, I decided that, as there was little to hope for in a modification, a radical change seemed desirable. Talking with Mr. B. V. Pfeiffer, of the Nashville (Tenn.) Gas and Heating Company, one day (in fact, on many days) he referred to the great cost of unloading a purifier, saying that it was not so much the expense of shovelling the oxide as the cost of taking out and cleaning trays, finding new or old ones to fit special positions, repairing damaged ones, and putting back the chinese puzzle. He suggested something stronger, simplier, less likely to get damaged, cheaper in first cost, and added: "If you could design an arrangement for utilizing something we can get from any lumber yard, it would be a splendid thing, say, some 2 by 4 timbers." The idea seemed excellent; but how to carry it out? I got busy and had some castings made, which the gas company decided to try out; but, first of all, I protected the idea which you will find more fully explained later on.

We made 50 castings, Style C, which are now obsolete, because of the weight, coupled with the difficulty of threading the 2 by 4 timbers through the holes. The idea was all right, but not fully developed. The grids worked well when in place, but it cost too much to handle them. I took them back and cast 50 more, Style A, which we strongly recommend as the best form of this patent. Examine the drawing, and you will quickly follow the explanation.

The way Mr. Pfeiffer filled the 14 feet by 18 feet box was as follows: He gave up the idea of doing away with the frame which is usually employed, for supporting the old style grids. As his box called for a loose frame, he did away with the numerous cross bars and verticals, and used simply two rows of flat bars, running across the 18 foot length of box, supported at intervals, from the floor of the box, on pedestals of brick, laid loose and 3 high (7½ inches free space below grids). We then placed on same 2-inch by 4-inch dressed timbers about 13 feet and 10 inches long, spanning the 14 feet length of box. These were spaced with the special castings, Style A. Two rows of castings were used, placed about 2 feet from the sides of box, making the space between the two rows about 10 feet span. These spacing castings form a support for the supplementary and coarse grid as shown. You will observe that in this way we got a grid formed of 2 by 4 timbers, with ½-inch spaces, across the whole floor of box, and raised to make a 7½-inch space between the underside of grid and bottom of purifier. About 12 inches above the top of this grid we get another, but in this case the space between the 2 by 4 timbers is about 3 inches. Before beginning to load oxide we put about 8 inches of nut to large size coke in the purifier; this is not really necessary, but is quite a good idea. This rested on the fine-space grid, and came nearly to the lower side of coarse grid.

The oxide was now put in—dumped from wheelbarrows. It rested on the coke, and, as the coarse grid takes the bulk of the weight of the oxide, it is simply impossible to pack same into the ½-inch spaces in the lower grid. Another thing. The men loading the box stand on the coarse grid, and the oxide cannot be tramped down on the lower grid. This keeps a free and open oxide on the grids and prevents back pressure. It would surely be waste of time dilating on the advantages of these grids. Just note how easy it is to unload a box. You need not even take the 2 by 4 timbers out. Just lift the upper ones and take out the castings. This separates the members of the lower grid which then need no cleaning. If you want to fit specials in a round box you can easily do so, although we advocate some permanent plates for such places, and will be glad to explain the system to anybody interested. The first cost of these grids is less than for trays. And Mr. Little (Nashville, Tenn.), is ready to narrate full particulars.

A Dessau Vertical Retort Model.—One of the attractive displays at the National Gas Exhibition, Shepherd's Bush, London,



England, was a good working model of the Dessau vertical retort system. The photographic reproduction herewith (from the *Journal of Gas Lighting*) shows a bed composed of 18 retorts, each of 13½ feet.

Compact Steam Power Plant.—For some 10 or 12 years European engineers have been familiar with the "Lokomobile," a name given to a combination of boiler, engine and superheater, compactly assembled in order to eliminate radiation and piping losses, cylinder condensation being largely done away with by carrying the superheating up to about 600°. The engine is mounted on top of the boiler, even in units as large as 1,000-horse power, and with it the generator, if the installation is for producing electrical energy. The saving in floor area is remarkable, the 1,000-horse power Lanz unit, which supplied the electric lighting and motor service for the Brussels Exposition in 1910, occupying but 24 feet by 32 feet.

Loss of heat from the cylinders is minimized by locating them in the steam dome of the boiler, or in the chimney uptake, where the waste heat gases prevent radiation losses, and in the case of the low pressure cylinder, return a certain amount of heat through the cylinder walls.

The boilers are of the internal corrugated furnace, fire tube type, built to carry a pressure of 225 pounds. By removing the bolts from the flanges, the furnace and tubes can be withdrawn for inspection and cleaning. These boilers have a notable record for safety; although there are over 50,000 of them in use, an explosion has never been reported.

The superheater proper consists of a single coil of seamless steel tubing, through which the steam passes in a direction counter to that of the combustion gases. The exhaust steam from the high pressure cylinder, before being admitted to the low pressure cylinder, is led through a secondary superheater, or reheater, consisting of a number of small tubes expanded into headers. Both superheater and reheater are suspended from rollers on an overhead track, allowing for expansion of the piping, and affording an easy means of removal from the smoke box, if ever necessary. Soot and dust are removed from the boiler tubes, superheater and reheater by a steam-jet blower, which can be used without interfering in any way with the firing.

Steam coal of any grade, fuel oil, gas, or refuse, can be burned by making suitable alterations to the furnace. The labor of firing is greatly reduced owing to the small amount of fuel to be handled. The fact that users of power in quantities as low as 100-horse power may obtain, from such an installation, fuel economies not possible even with the largest compound condensing plants of the usual design, should direct attention to the general adaptability of this efficient and compact source of power.

Fig. 1 is a 130-horse power tandem, compound lokomobile, with

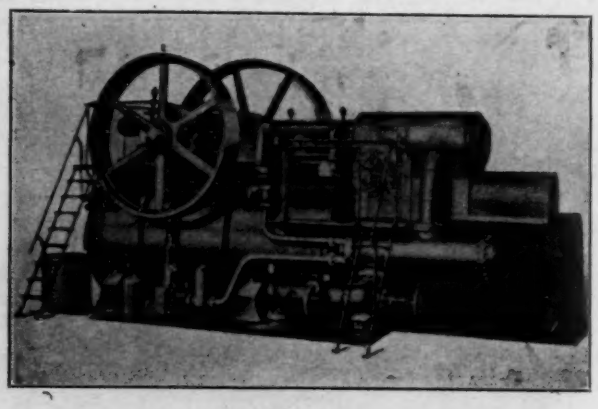


Fig. 1.

single superheater, a German design, which holds the world's record for economy. One of them supplies the electric lighting for the Czar's palace at Peterhof, where the steam consumption is 7.06 pounds and the coal 0.74 pounds per brake horse power. The 1,000 horse power Lanz lokomobile at the Brussels Exposition consumed 9.2 pounds steam and 1.1 pounds coal in the day's run tests, the difference between it and the Wolf engine being due to double superheat of the latter, and the jacketing of the cylinders with the chimney gases instead of with the boiler steam, as is the case with all the Lanz engines.

Fig. 2 shows a 150-horse power Buckeye-Mobile, built in Salem, O.

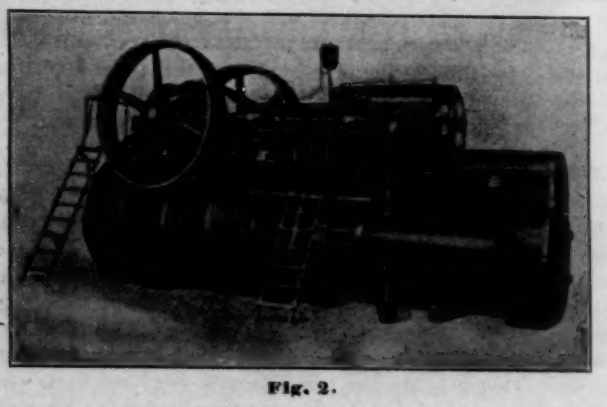


Fig. 2.

Fig. 3 being a longitudinal section. This is the first of this type of

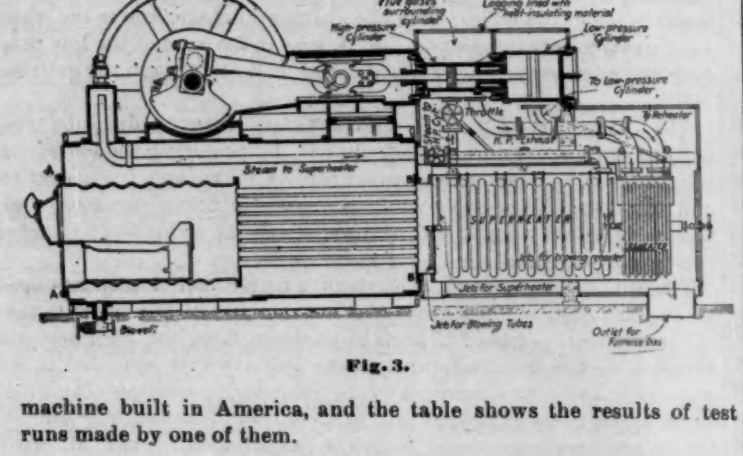


Fig. 3.

machine built in America, and the table shows the results of test runs made by one of them.

Test No.	I.H.P.	B.H.P.	Water per I.H.P.-Hour, Lb.	Coal per I.H.P.-Hour, Lb.	Avg. Boiler Pressure, Gage, Lb.	Avg. Vacuum. In.	Superheat, H.P. Cyl.	Degs. F. L.P. Cyl.
4	162.	148.	10.1	1.51	206.5	26.62	273.	193.
5	128.2	115.	9.78	1.61	201.5	27.58	227.6	164 1
7	200.	192.	9.9	1.6	204.	27.23	302.	229.
10	84.6	77.	13.3	1.95	200.	27.75	170.4	119.5
12	160.1	95.6[1]	.....	1.40	208.5	23.25	263.	189.4
14	169.	101.4[2]	9.2	1.08	209.	25.7	218.	178.

1. Kilowatts delivered by generator; load factor 76.5 per cent.
2. Do., load factor, 81 per cent.

Items of Interest
FROM VARIOUS LOCALITIES.

Messrs. Findlay & Redding, the Candler Building, Atlanta, Ga., have been granted a franchise to construct and operate a gas plant in Gainesville, Ga., by the authorities of that city. The franchise is to live for 50 years, and the grantees inform us that they will begin actual construction work early next spring.

"B. V. B.," writing from Boston, Mass., under date of the 14th inst., informs us that Messrs. Ford, Bacon & Davis have disposed of their holdings in the American Cities Company, and will terminate their connection as operators of the properties of that corporation the first prox. Thereafter the United Gas and Electric Corporation, in which Messrs. Ford, Bacon & Davis have an influential interest, will operate the American Cities Company. At a meeting of the latter corporation, held in New Orleans the 10th inst., Mr. George H. Davis resigned as President, and Mr. Hugh McCloskey, President of the New Orleans Railway and Light Company, was elected to succeed him.

At a meeting of the Public Service Commission (Second New York District), Commissioner Martin S. Decker presiding, held in New York city the 13th inst., the matter considered was the application of certain residents of Rockville Center, L. I., for a lower gas rate than that charged by the Nassau and Suffolk Lighting Company. Amongst those heard in favor of the petition were Mr. D. N. Burleson (President of the Village), and Trustee Edwin W. Wallace, with Mr. Francis G. Hooley, as counsel for the property owners. Mr. George MacDonald (its President) represented the Company. The petitioners declared they are paying at the rate of $1.50 per 1,000 cubic feet, whereas the residents of Lynnbrook, Oceanside and East Rockaway were being served by the Queensboro Gas and Electric Light Company at the rate of $1.15 per 1,000, and that the mains of the latter ran through the middle of Rockville Center in order to reach the named sections to the south of it. Mr. MacDonald asserted that the authorities hampered the Company in many ways, especially in respect of making main connections and in the instance of paving, etc. Further, the Company was obliged to pay into the village treasury the sum of 5 per cent. on its gross receipts, which actually made the rate $1.42½ cents per 1,000; and that the village was the only one exacting a money compensation for permission to use its streets. The hearing was adjourned to the morning of December 8th, the session to be held in the office of the Village Clerk, at 10 o'clock.

Mr. Victor T. Noonan, of the Rochester Railway & Light Company, has been appointed Safety Inspector, for the Western New York District, by the Empire State Gas and Electric Association.

The H. Floyd Company, of Traverse City, Mich., has applied to the authorities of Sault Ste Marie, Ont., for the right to there construct and operate a gas plant.

"Wilson," writing from Brooklyn, N. Y., under date of the 17th inst., says: "I note your recent remarks respecting Messrs. W. Bourke Cockran, L. Napoleon Levy and Mr. Thos. Read, who, as 'representatives of a minority,' made music at the annual meeting of the Brooklyn Union Gas Company, their discordant notes being sounded in the slogan of 'Down with the majority.' As the Brooklyn *Daily Eagle* said in its account of the meeting, 'What they lacked in votes they made up in volubility.' The assailers of the management asked for increased dividends and prayed for an increase in the Board of Directors, asking that the latter be 15 instead of 7. However, to put the thing in a nutshell, the retiring Directors (Messrs. Wm. Rockefeller, D. G. Legget, Elverton R. Chapman, H. W. Cannon, W. G. Rockefeller, H. H. Rogers and James H. Jourdan), were named to succeed themselves. The shareholdings in favor represented 107,517 out of a total shareholding of approximately 180,000. And that should be sufficient to show the 'influence' of the 'minority.' Yes; Bourke is certainly a purist!"

On the 11th inst. the voters of La Junta, Col., in a special election, voted almost unanimously to grant a 20-year franchise for the operation of a gas works in the named place to the Rocky Mountain Gas Company.

We have scant mention of the death of Mr. F. F. Fullam, who passed away, the 8th inst., in his 54th year. Mr. Fullam was for some time in engineering charge of the plant of the Clinton (Mass.) Gas Light Company.

Mr. Joseph Mayer, for some time connected with the Hazleton (Pa.) Gas Company, has been elected President of the Lakewood (N. J.) Gas Company, Belmar, N. J.

Those who may remember the vagaries and eccentricities of the more or less famous Erzam Jerzmanowski, whose exploitation, particularly of the Equitable Gas Light Company, New York city, was sufficient to identify him in the minds of all connected with the gas supply of New York during the "eighties" of the last century, may be interested in knowing that a settlement in respect of his estate has been reached. He died February 7, 1909, and the final adjustings show that his properties were estimated or assessed at a valuation of $991,600, of which sum $294,738 of net value was taxable in this State. His widow (resident of Prokocim, Austria) is the chief beneficiary, and on her death a fund becomes operative for the founding of prizes to be awarded to "Any Polish man or woman, who by literary, scientific or humanitarian works, shall gain remarkable position in Polish Society." The designator is to be the Cracow Academy of Science.

The Boston *Transcript* says that Messrs. Stone & Webster, of Boston, have made an offer for the majority of the stock of the Bristol & Plainville (Conn.) Tramway Company, which concern also controls the gas and electric lighting systems of the named places.

Messrs. C. J. Jacobs, S. E. Robinson and H. W. Davis have filed with the Secretary of State, of Delaware, papers announcing the incorporation of the International Manufacturing Corporation, to "Manufacture gas for producing light, heat and power." It is capitalized in $10,000,000, and it is averred that the main parties in interest are capitalists of St. Louis, Mo.

At the annual meeting of the Elizabethtown (N. J.) Gas Light Company these officers were chosen to succeed themselves: Directors, John Kean, Ham. F. Kean, John W. Whalen, Alex. L. Kean, Francis Engel and Julian H. Kean; President, John Kean; Treasurer, Julian H. Kean; Secretary, Francis Engel.

At last the construction of a gas plant, to supply the residents of Greenwich, Conn., and immediately surrounding settlements, seems assured. In any event, the proprietors of the Citizens Gas Company, Greenwich, have purchased the Barker property in the Cos Cob district, which plot comprises 2 acres of land on the river, nearby the extensive motor works of the Palmer Brothers, and the further planning means an expenditure of not less than $75,000 on plant placing. Practically all the stock has been subscribed by local people, and those interested actively in the management are men of probity and of material means.

Mr. Curtis Jackson has been appointed to fill the vacancy on the local staff of the Clinton (Mass.) Gas Light Company occasioned by the promotion-transfer of Mr. Reynolds.

"B. L.," writing from Lawrence, Mass., under date of the 17th inst., says: "The current exhibition, in Lawrence, Mass., which the managers thereof titled the 'Sold in Lawrence Show,' was notable for its general excellence and for the attention bestowed upon it. And I am really only stating the plain truth when I say that the corner of State Armory Hall (in which the display was made) given over to the booths of the Lawrence Gas Company, was always crowded with visitors. The grouping was artistically done, and the exhibits included examples of all the newest and best appliances for the economic and successful use of gas as a lighting agent, as a kitchen help and as a general, all-around, useful servant. Another thing, those in actual charge of the display were every minute 'on the job.'"

Mr. H. C. Miller, Secretary and Treasurer of the Northern Indiana Gas Company, has decided that hereafter the auditing division of its clerical force shall be located in Hammond, Ind., instead of Michigan City, Ind

Mr. F. H. Mott, Secretary the Public Service Commission, Second New York District, has informed the parties in interest, in respect of the petition of certain residents of Utica, N. Y., protesting against the rate charged by the Utica Gas and Electric Company, that the Commission will hold a hearing in the premises, at 2 P.M., Friday, the 5th prox.

It is said to be on the cards that the voters of Ottawa, Canada, will, at the January elections, ballot on the proposition to establish a municipal gas plant. While our information does not specify, we take it for granted that the vote will mean whether or not the existing plant of the Ottawa Gas Company will be purchased by the people for operation on municipal account.

Early this month the Directors of the Citrus Belt Gas Company voted to discontinue the injunction suit pending against the city of San Bernardino, Col., relative to the enforcing of the $1 per 1,000 rate for gas made there some time ago. As our correspondent states: "This action automatically puts into effect the provision of the ordinance."

"Mac.," writing from Brockton, Mass., under date of the 15th inst., says: "I believe it was the mother of Perseus (otherwise Danae) who was in the habit of 'showering' her relations with pieces of gold, and while I do not wish it even thought Owen Judge in any sense, shape or manner could be mistaken for Danae, or that Mark Fitzmaurice has the slightest approximation to, from or by the mythological person known as Zeus, nevertheless the similitude in a certain sense was shown in busy Brockton the night of the 8th. Mark Fitzmaurice is a fixture as foreman in the Brockton Gas Company, and while he may not at first glance in any way resemble a seraph, nevertheless, he is first in the hearts of his men; this is what happened the night in question. About 100 of the Fitzmaurice forces stormed his home, and 'showered' him with gold pieces, that totalled the tidy sum of $200. Of course, 'Fitz.' was overcome, but he retained the gold. Afterwards, the tinkle of glasses added to the mellowness of the occasion."

This is from Racine, under date of the 16th inst.: "From faraway Texas recently came a copy of the Waxahachie 'Daily Light' containing a description of the new gas plant established in Waxahachie by H. M. Wallace, and associates, of Detroit. They are the people who, with Andrew Fyfe, of Grand Rapids, Mich., built the Stoughton (Mich.) plant in 1906, and they also hold the bulk of the shares in the Waxahachie enterprise. The main system of the Texas plant covers 12 miles, the storage holder will retain 80,000 cubic feet, and the generating plant is of the modern water gas type."

The Stacey Manufacturing Company has completed the new holder at Springfield, Ills. It is 129 feet in height, and is of the 3-lift order, with an ultimate capacity of 1,000,000 cubic feet. Supt. A. L. Flannagan had charge of the construction.

Mr. W. Cullen Morris, Engineer of Construction, New York Consolidated Gas Company, has filed plans for a coal pocket, at the foot of East 110th street, to have a dimension of 70 feet by 30 feet, and 2 stories high.

Mr. Samuel M. Vance, General Manager, the Bristol (Tenn.) Gas and Electric Company, served as a delegate to the National Conservation Congress, which body was in session in Washington, D. C., November 18, 19 and 20.

The proprietors of the Minneapolis (Minn.) Gas Light Company have offered to refund the difference between 70 cents per 1,000 cubic feet (the price set under the new ordinance), and the ruling rate of 85 cents, from date of the affirmance by the Superior Court of the ordinance. Of course, the plan provides for the setting aside, in the custody of a properly designated repositary, the 15 cents per 1,000, until the questions at issue shall have been decided by mandate of the U. S. Supreme Court.

Mr. Herbert L. Harries has resigned the position of Assistant General Manager, the Louisville (Ky.) Gas and Electric Company.

The Columbus (O.) Gas and Fuel Company has adopted the system of district stations, where bills may be settled by consumers. Three districts have been apportioned.

"B. T. F.," writing from Amherst, Mass., under date of the 15th inst., informs us that the authorities have entered into a contract with the Amherst Gas and Electric Company for the public lighting for a period of 3 years, dating back to June 1, 1913. The former 32-candle power incandescents are to be replaced by lamps of 48-candle power, at $14.50 per lamp per annum. The arc lamps are to be replaced, "partly by large incandescents of equal efficiency, at $50 each per year, and partly by an equivalent number of the smaller units, properly distributed." An every night schedule has been substituted for the moontable plan, and the lights will be kept in service until 1 A.M., instead of 12, midnight, as heretofore.

The Market FOR GAS SECURITIES.

The market for city gas shares is without active sign. There are no sales, and there is no demand for the stock. Meanwhile no stock is offered at the quoted prices. Consolidated opened to-day (Friday) at 126½ to 127½, which, of course, is ex-dividend for the quarter.

Brooklyn Union is dull and neglected, with a wide disparity as between buyers and sellers, the quoted official figures being 122 to 128. The Dow-Jones circular for this morning contains a calm, mathematical statement respecting the Company's business, which shows how well the people in charge of its affairs deserve continuance in such management. It is well worth reading and studying. The gross output for the year will be 14 thousand millions cubic feet. The increased cost of operation (mainly regarding higher oil costs and taxes) has put the total cost on all accounts to 71 per cent. of the gross receipts, wherefore, with the added probability of a further increase of 1 cent per gallon as to oil quantities, the management seem amply justified in disregarding the howl for an increase in dividend disbursements from the bayers headed by Cockran and his pack.

The semi-annual dividend of 2 per cent. on the preferred shares of the Massachusetts Gas Companies is payable Monday, the 1st prox., and Secretary Townsend notifies us that the regularly quarterly of 1¾ on the American Gas Company's shares is also payable December 1st. Messrs. Byrne & McDonnell are offering $175,000 City and Suburban Company Wheeling (W. Va.) 20-year 6's, at par and interest, secured by an absolute first mortgage on the Company's entire property, valued at $671,000. These bonds look to us a first-class investment.

The $15,000,000 increase in the capital of the Peoples Gas Light and Coke Company, of Chicago, has been certified to, and the shareholders have also ratified the proposition to execute an open mortgage, to run for 50 years from the first prox.

On November 20th, the Directors of the Louisville (Ky.) Gas and Electric Company declared an initial quarterly of 1¼ per cent. on the preferred. The New Britain (Conn.) Company's proposal to issue $100,000 new stock has been ratified by the shareholders, the matter of payment on such account to be determined in the near future.

In connection with the Peoples new stock it should be said that the payments thereon by existing shareholders, to be made in respect of their allotment of 1 new to 10 of old, are thus arranged: 25 per cent. each, on Dec. 22, Feb. 22, May 22, and Aug. 22. The bond market is fairly active. The Laclede Company's dividends are payable thus: Preferred, quarterly, 1¾ per cent.; semi-annual, common, 3½ per cent.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

NOVEMBER 24.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par alue of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$99,816,500	100	126½	127⅛
Central Union Gas Co. —				
1st 5's, due 1927, J. & J.	3.500,000	1,000	101	103
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	106	108
Mutual Gas Co.	8,600,000	100	157	157
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	99	197
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	59	62
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98½	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	98	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	106	112
Standard	5,000,000	100	102	104
Preferred	5,000,000	100	93	94
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	90	95
The Brooklyn Union	15,000,000	1,000	122	128
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	399,650	500	130	—
Out-of-Town Companies.				
Cincinnati Gas and Electric Co.	29,500,000	100	69	70
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus Gas Light & Fuel Company	1,682,750	100	65¾	66¼
Preferred	3,026,500	100	33	35¼
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	130	138
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	85	90
" Bonds, 5's	2,650,000	—	90	93
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	200,000	1,000	97	100
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	108	
Massachusetts Gas Companies, of Boston	25,000,000	100	1	91⅛
Preferred	25,000,000	100	91½	93½
Laclede Gas Co., St. Louis.	10,000,000	100	96	98
Preferred	2,500,000	100	—	102½
Bonds	10,000,000	1,000	102½	103
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	118	118⅛
1st Mortgage	20,100,000	1,000	103	103½
2d "	2,500,000	1,000	104	—
Pacific Gas and Electric Co.	15,500,000	—	35½	35¾
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	90	93
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	8,447,000	1,000	94	96
Syracuse Gas Co., N. Y	1,976,000	100	50	55
Bonds	2,047,000	1,000	101	103
United Gas Imp. Co.	55,502,960	50	168	170
Washington (D. C.) Gas Co.	1,800,000	200	420	425
1st Mortgage, 6's	600,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, New York, October 21, 23, 1914. Officers: President, W. H. Gartley, Philadelphia. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting————1914. Officers: President, A. A. Dion, Ottawa; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct., 1914. Officers: President, J. T. Hutchings, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Gas Meters.—Monthly Section Meetings; Grand Commissioner, Will. W. Barnes. East Orange, N. J.; Gen'l Sec'y, H. Thurston Owens, La Crosse, Wis.; New York Section, Chairman, W. H. Pettes; Secretary, G. E. Smith, Sipp Avenue, Jersey City, N. J. Philadelphia Section; Chairman, Stanley Grady; Secretary, H. E. Stiteler, Broad and Arch streets. Cleveland Section, Chairman, F. R. Hutchinson; Secretary, Wm. Holtz, East Ohio Gas Co. New England Section, Chairman, T. W. Jennings, Boston; Sec., F. K. Wells, 60 Broad street, Boston. Winona Section, Winona, Minn., W. F. Clausen, Chairman. Bethlehem Section, Trueman Weithnecht, Chairman; Sec.-Treas., Truman Buss. South Bethlehem, Pa.

Guild of Gas Managers of New England.—Annual meeting, March, 1914. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 18th and 19th, 1914. Chicago, Ills. Officers: President, W. F. Barrett, Chicago, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting, Cleveland, O., September, 1914. Meetings of Sections, monthly. Pres., Charles O. Bond; General Secretary, J. D. Israel, 29 W. 39th street, New York City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 38 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

Indiana Gas Association.—Annual meeting, March —— —— 1914. Terre Haute. Officers: President, A. S. Cooke, Terre Haute; Vice-President, A. C. Blinn, Evansville; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, Davenport, May 27, 28, 29, 1914; Officers: President, B. C. Adams, Lincoln, Neb.; Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October—— 1914. Arkansas City. Officers: President, Al. Newman, Arkansas City; Secretary and Treasurer, Ivan Thomas, Wichita Kas.

Michigan Gas Association—Annual meeting, September, 1914. Place, undetermined. Officers: President, H. W. Douglas, Ann Arbor, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1914; Mexico, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and gas show, Dec. 1-6, 1913. Philadelphia, Pa. Officers: President, C. W. Hare, Philadelphia Pa.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, St. Louis, Mo., May 19 and 20, 1914; Officers: President, E. L. Brundrett, Kansas City, Mo.; Secy-Treas., T. Clive Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, 18th and 19th, 1914, Boston. Officers: President, T. H. Hintze, Providence, R. I.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Next Meeting, —— ——, 1914, Asbury Park N.J. President, C. F. Butcher, Freehold, N. J.; Sec'y-Treasurer, O. F. Potter, Newark, N.J.

Ohio Gas Association.—Annual meeting, February ——— 1914 Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, Oklahoma City May, ——1914. President, F. E. Bowman, Ada; Secretary-Treasurer, H. V. Bozo Oklahoma City.

Pacific Coast Gas Association.—Annual meeting, Long Beach, Cal., September ——— 1914. Officers: President, C. S. Vance, Los Angeles, Cal.; Secretary-Treasurer, Henry Bostwick, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, Allentown, Pa., April ———, 1914; Officers, President, J. A. Frick, Allentown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 11, 1913; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city.

Southern Gas Association.—Annual meeting, Mobile, Ala., April 4, 1914, Officers: President, James Ferrier, Rome, Ga.; Secretary-Treasurer, H. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting, May——— 1914, Galveston, Tex. Officers: President, G. H. Gifford, Fort Worth Tex.; Secretary H. S. Cooper, 405 Slaughter Bldg., Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May ———1914, Milwaukee, Wis. Officers: President, Ewald Haase, Milwaukee, Wis.; Secretary-Treasurer, Henry Harman Milwaukee, Wis.